

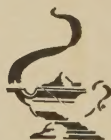
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HISTORY OF DENTAL SURGERY

CONTRIBUTIONS BY VARIOUS AUTHORS

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UNIVERSITY DENTAL SCHOOL

IN THREE VOLUMES

Volume 1

History of the Development of Dentistry, Operative Dentistry, Prosthetic
Dentistry, Orthodontia, Oral Surgery, Dental Literature, Dental
Journalism, Dental Education and Dental Colleges.

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Preface

NEARLY every profession, trade, craft, order or society has had the story of its inception and development recorded in some way, available for consultation and reference by those interested.

Dentistry has not now available a historical work in which the record of its mighty achievements is preserved, a history of its rise, progress and development arranged in systematic, chronological, comprehensive and reliable form. To supply this need and to preserve the memory and perpetuate the names of the men who wrought so strenuously and devotedly to initiate and achieve the wonderful improvement, discoveries and inventions that made dentistry what it is today, is the object of this publication.

When the undersigned consented to undertake the task of writing for this work and to accept the editorial charge of it, he did so reluctantly, but the assurance of much needed assistance from many of the loyal, earnest and devoted laborers in the cause of dental progress, persuaded him to assume the responsibility.

He was also persuaded to believe that the gathering of the historic truths with reference to the evolution of dentistry, which are now so widely scattered, and their arrangement in one volume, or set of volumes, would be of as much interest to the dental profession as the compilation of general history and biography is to the general public. He furthermore believed that the profession, especially in America, has arrived at such a stage of solidarity and vigor, by reason of its proud achievements of the past and present, and assured position for the future, that it would gladly stop for an occasional moment, to inquire into its ancestry and to approve a permanent chronological record of the milestones along the road of its progress.

The history of dentistry now is scattered throughout a very extensive and diversified literature. This was exhaustively searched, and the gathered gleanings have been assembled and are presented in these volumes. In a work of this kind divided into subjects that are closely allied, and the lines of demarkation of which are at times difficult to define, it appears almost impossible to

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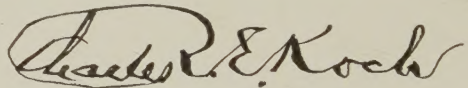
avoid some repetition, especially when, as in this history, chapters are written by different authors. It is believed, however, that wherever such repetition of **matter** occurs in this work, it is presented in an entirely different setting and with such diversified side lights, as almost to constitute it new matter.

It is hoped that the motive for the writing and compiling of this history has been sustained sufficiently well in its pages to earn the appreciation of the profession.

While the Editor desires to extend his most grateful acknowledgment to all the contributors, who produced the chapters on Societies, Dental Laws and their administrations, and on Dental Colleges and Schools, he feels particularly indebted to Drs. Edmund Noyes, Henry L. Ambler, Simeon H. Guilford, Edward C. Mills and William H. Trueman. Associate Editors, who wrote the sections on Operative Dentistry, Prosthetic Dentistry, Orthodontia, Dental Literature and Dental Journalism, respectively. To Dr. Burton Lee Thorpe the Associate Editor, who has assumed the entire charge of the second volume, devoted to the history of the men who made a history of the dental profession a possibility, the Editor desires to extend his sincere thanks.

Many suggestions and much assistance have been received during the four years that have been spent in preparation of this publication from Drs. William H. Trueman, Edward C. Mills, G. V. Black, Charles McManus, Truman W. Brophy, Frederick B. Noyes and Thomas W. Gilmer, which is hereby thankfully acknowledged.

CHICAGO, DECEMBER, 1908.



After the form relating to the dentistry of the middle ages had been printed, Dr. Edward C. Mills called the attention of the Editor to a medical work published in 1450 by Giovanni d'Arcola of Padua, in which he mentions gold leaf for the filling of decayed teeth. The earliest published references to gold being used for this purpose, as noted in the chapters of this book, is 1532.

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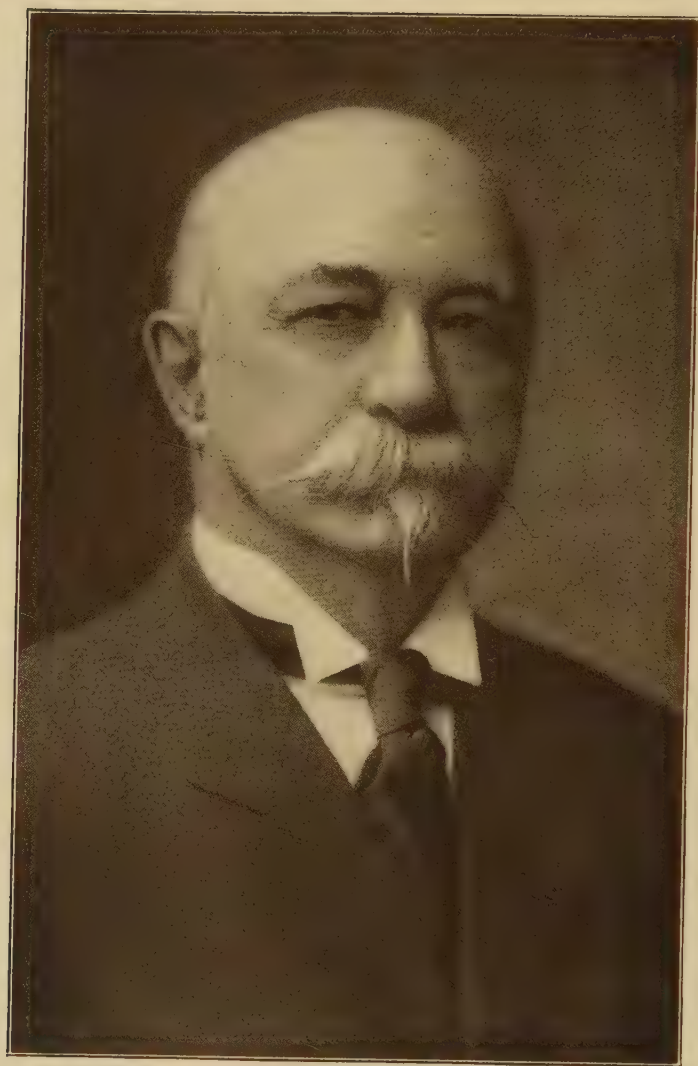
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Isidor R Koch

A History of the Development of Dentistry

By Charles R. E. Koch, D. D. S., Chicago, Ill.

EGYPTIAN AND GRECIAN ANTIQUITY.

IN order to pursue the study of history intelligently and with advantage, it is frequently essential to throw the search lights of investigation back to periods and beginnings which are shrouded by the mysterious and fabulous traditions of the mythological ages. It has always been desirable, and, in fact, essential, in the study of history, that a broad view of antecedents be had in order fully to realize and understand that which was, and to learn the trend of thought and of action in the onward march of time which resulted in events and developments that brought about that which now is. The growth, evolution and achievement of nations have been on a parallel with that of science and of art. Neither has been of sudden creation, but each has been the result of slow accretion.

The history of dentistry in the initial evolution stage must be traced to that of medicine and surgery. It seems like a paradox, and yet it is undoubtedly true, that the beneficent profession of the healing art had its origin in sacrificial offerings of animals to the honor of Deity, and in their uses as human food. These, to some extent, taught a certain class of men anatomy and physiology of the lower animals at least. Man, in his private and associated capacity, ever since the days of Cain and Abel, has indulged in private and public combats resulting in injuries and wounds of the human body. It is fair to suppose these developed something of the knowledge of human anatomy and physiology. The ancient Egyptians undoubtedly gained greatly in knowledge of the structure of the human body and its physiological functions as a result of their espousal of the doctrine of soul migration, which led them to

greater care in the preservation of the dead human body, and thereby developed the embalmer's art. With the unfolding of this knowledge it would not seem unreasonable to assume that a conception of causes of diseases and remedies for the same was also developed.

We are told that in China, Confucius; in Persia, Zoroaster; in India, Brahma, and the early Egyptian writers as well, treated particularly upon medicine, but nothing very definite is known about their works. Moses (Genesis 50:2) makes the first reference to physicians, about 1639 B. C.—“Joseph commanded the servants and physicians to embalm his father, and the physicians embalmed Israel.” These physicians were Egyptians. With the Israelites, as well as early Grecians, their priests and poets were also their physicians. At a later period the soldiers or heroes, such as Telamon, Teucer, Achilles, Chiron, Aesculapius and Podalirius, were also physicians. The three last named left behind them some reputation as medical men. It must be remembered, however, that all these men might really be classed only as surgeons, and that their renown as such was based chiefly on their skill and expertness in extracting darts.

Aesculapius, the god of medicine, is presumed to have been the son of Apollo. He was taught the art of healing and, the story runs, was so successful in restoring life that Jupiter became enraged at his success and, to gratify jealous anger, destroyed him with a thunder bolt. Cicero mentions three deities of this name. The first, son of Apollo, who invented the probe and bandages for wounds; the second, the brother of Mercury, who was killed by lightning; and the third, the son of Arsippus and Arsinoe, who was the first to teach tooth drawing and blood-letting. The instrument this last mentioned god employed for tooth drawing is supposed to be the same that was later exhibited in the temple at Delphos. It was said to have been made of lead, and this would indicate that no great force was to be used in tooth extraction. If this legendary story is accepted as a statement of fact, we are forced to conclude that loosening of the teeth from what is now called pyorrhea was a malady not unknown to the Greeks a thousand years before the Christian era.

The Papyrus of Ebers, which it is claimed, dates back to 3700 B. C., while mentioning diseases of teeth and gums and giving a number of prescriptions for the treatment of dental diseases, nowhere mentions prosthetics. It is stated with a great deal of assurance by many Egyptologists, that in their research among the skulls of ancient Egyptians and of mummies, even in those of kings, no evidence has been found suggesting dental prosthesis; and yet it

seems almost impossible that the people of Phoenicia, who we have evidence were versed in dental prosthesis, should have been able to keep from imparting this art to the Egyptians, as they were near neighbors and related by the bonds of trade, and also owed allegiance to the Egyptian sovereigns. It may be that the cult or religion of the Egyptians did not permit them to retain prosthetic pieces after death.

About 850 B. C. the Pastophori of Egypt devoted themselves to the practice of medicine under a system taught and promulgated in a portion of their Bible, which is credited as having been inspired and written by the hand of Thoth or Hermes, and is supposed to have had its origin during or about the eleventh dynasty. This Bible is said to have consisted of forty-two books, which were divided into six divisions, the last of which consisted of six books, entitled "THE PASTOPHOR," which were entirely devoted to the healing art. These books treated of anatomy, of diseases, of instruments, of materia medica and pharmacy, of diseases of the eyes and of those of women. Egypt at that time was the most cultured country of the world, and Homer relates that every man there was more or less skilled in medicine, but no one man practiced all of its branches.

Ancient Egypt understood and observed the division of labor. If Herodotus, the great historian, who wrote 500 years before the Christian era, is worthy of credence, we are forced to believe that in those days, in that country medical practice was as much given over to specialists as in our own times in the great cities of our own country. He states:

"The art of medicine is so practiced in Egypt that there is found an individual healer for each individual disorder. Hence, the whole country is filled with healers. Some take charge of the disorders of the eyes; others of those of the head; others of those of the teeth; others of those of the belly and others of those of secret diseases."

Thus it is that Egypt undoubtedly was the cradle of dentistry as a distinctive branch of the healing art. These "Pastophori" held hereditary office as priests, and, as their knowledge and skill in the healing art was handed down from father to son, it seems reasonable to suppose that the professor of each particular branch may have reached great proficiency, in so far as dental services were then in demand, under the aesthetic and sanitary requirements of then existing society. We are warranted in believing that Egyptians skilled in this direction exceeded those of other nations by the fact that the monarchs and grandees of other countries of the world for many years employed Egyptians only as their surgeons and physicians,

until the time when their skill and reputations were finally supplanted by the superior skill of the Greeks.

The Greek philosopher, Thales, studied at Miletus and established a school of philosophy and medicine in Europe about 780 B. C.; Pythagoras studied at Thebes and established his school about 580 B. C., in Italy. These two hundred years were an important epoch in medical science and art in Greece, where, up to that time, they had occupied an exceedingly degraded position. The priests of Apollo were the practitioners and professors, and most of them substituted delivering of oracles for the prescription of medicines or surgical treatment. The few men who still practiced the healing art set up an opposition god in the name of Aesculapius, who was from this time on represented as the son of Apollo. Numerous temples were erected to him, to which the sick resorted for treatment. Those of Cos and Cnidus were the principal ones. As Aesculapius had been represented as the son of Apollo, so his priests were represented, each of them, as descendants of Aesculapius, and they called themselves Aesclepiadae. Priests were the only physicians of antiquity.

The Christian church has canonized Saint Apollonia as the patron saint of dentistry. This is of a parallel to the ancient Greeks who looked upon Aesculapius as a god. Homer speaks of "the blameless physician whose sons were serving in the Greek army at the siege of Troy," when referring to him. A peculiar breed of serpents was sacrificed to Aesculapius, the sale of which was a source of great revenue to these priests. Aesculapius, under the image of a serpent, was worshipped by the Romans, and if Eusebius is to be credited, the Egyptian Aesculapius was worshipped under the form of a divine serpent.

In Arabia, India and China the serpent was looked upon as the symbol of life. Oriental nations believed it to be the most cunning of all animals, and immortal. The emperors of China bore the image of a serpent upon their breasts long before Moses made the brazen serpent to cure the children of Israel from the bites of the fiery serpent.

The winged wand entwisted by two serpents, known as the "caduceus," is a symbol of prosperity; the rod represents power; the serpents represent wisdom, and the two wings, peace and activity. This has long been the emblem of medicine, and in the army of the United States it is the hospital steward's insignia of office.

The practice of the healing art in the early days, under pagan as well as under early Christian civilization, was based upon the belief that disease was

of celestial origin and required divine interference for its relief. Religion and medicine were practiced together; through the instrumentality of priest-physicians sacrifices or votive offerings of value served to enrich the temples and to appease the anger of the gods. Charms, talismans and amulets were prescribed to cure or to prevent disease. Medicine was practiced but little. The surgical treatment of wounds consisted largely in bathing in warm water, in sucking out the blood, and in dressings of various herbs. The verdigris of metal weapons was used to stop the flow of blood. Achilles cured the wound of Telephus with the rust of his lance. This styptic has still a place in our *materia medica*. Great power in healing wounds was ascribed to charms and incantations.

“With bandage firm, Ulysses’ knee they bound,
Then chanting mystic lays, the closing wound
Of sacred melody confessed the force;
The tides of life regained their azure course.”

Fumigation with sulphur was practiced after the sacrifice of animals.

“With fire and sulphur, cure of noxious fumes,
He purged the walls of blood polluted rooms.”

A later generation of the Aesclepiadae, which was established at Cos, was represented by Hippocrates, who flourished about 460 B. C. He was from infancy made aware of all that was known in his own country regarding the practice of medicine, and studied further under Heraclitus, who was a student of Pythagoras and had traveled much, and who was so sorrowfully impressed with the weaknesses of his fellowmen that the nickname “the weeping philosopher” was given to him. His meditations and researches were recorded in his book “On Nature.”

This enabled Hippocrates to supplement his own knowledge and observations with whatever he found of value in Egyptian methods. He thus became not only the world’s great physician, but he was also the first analytical student of medical science. He made it his practice, wherever he resided, to visit the cemeteries and search for anatomical knowledge. His descriptions of the bones and of the teeth were the most advanced at the time. He was the first to know and describe the period of the eruption of the teeth as well as of their functions. He also described some of the diseases affecting them and their treatment, both by operation and medicine or dentifrices. He applied the actual cautery, and the plan of fastening loosened teeth with gold wire was first mentioned in his writings, although this practice undoubtedly ante-

dates him, as the contents of Greek, Egyptian and other tombs would lead us to believe.

Hippocrates deserves the admiration of all progressive men. Living in an age of superstition, in which the supernatural governed science and the healing art, he had the ability to discover natural causes and physical agencies, and the courage to proclaim them in spite of the opposition of long-rooted prejudice. His example is well worthy of the emulation of investigators and discoverers of any age.

Hippocrates mentions no prosthetic procedure in dentistry. This, however, does not necessarily prove that there was no prosthetic dentistry practiced in his time, or that it was unknown to him. The conclusion is perhaps justified that he, like the physicians and medical writers of later years, did not give much attention to prosthesis in any department of the healing art. They left the consideration of prosthetic appliances to specialists who devoted themselves to this practice as mechanics, whose work may not have been worthy their mention. We are told by Dr. Guerini that in a tomb of a Greek village near Thebes a dental appliance was found which dates back from 300 or 400 years B. C., which was "composed of a very small bar of very pure gold of about one half centimeter in length, folded in such a way as to form an elliptical ring, which, when applied around the four incisors, kept them in a fixed position, acting like a splint." This is only a little later than the period in which Hippocrates lived. So thorough a student and observer could not have been ignorant of the use of artificial substitutes, although their construction by him may have been beneath his dignity, and contrary to the usage of the age.

The dentifrices compounded by him would not at the present day appear very scientific, and yet when deprived of their mysticism and reduced to their reality chemically, they are not so ridiculous as they appear. "Take the head of a hare, and three mice, two of these having the entrails removed; incinerate them and reduce to ashes; then mix with equal weight of powdered marble," is one of these prescriptions.

Heraclitus of Tarentum, Erasistratus and Herophilus operated upon the teeth. The last two, who were professional descendants of Hippocrates, established a medical school in Alexandria, about 300 B. C. It came to be of great renown. We are told that by them, in this school, the dissection of the human body was first practiced. The Ptolemys patronized this school and became so much interested in anatomical science as to encourage human

vivisections by permitting condemned criminals to be made use of for such purposes.

These teachers discouraged the extraction of teeth unless they were so loose as to be easily removed with leaden forceps. Herophilus reported several cases of death resulting from tooth extraction—presumably in cases where the leaden forceps were not available.

Artificial substitutes for teeth were known and worn in the early Roman days. It has been claimed that teeth of gold were worn to replace lost natural teeth, but Romans of good taste greatly preferred substitutes that more nearly resembled the natural teeth. To this end they employed ivory or bone.

While Hippocrates and the writers of his time give no reference to dental prosthesis, Roman poetry contains suggestions that give indisputable evidence that artificial substitutes were worn by at least the ladies of the "upper tendom." In the first book of Martial occur these lines:

"If teeth like thine, lady, we would display,
With purchased bone and horn of India
Our mouths must be arrayed."

In his fifth book he uses this expression:

"Thais has teeth so black; Lecania white;
Seek you the cause? Lecania's teeth are bought,
While Thais wears her own.

Martial, it must be remembered, was born in Spain in 43 A. D., and came to Rome in 66. He remained there until 100, after which he returned to his native town and died there about 104 A. D. His epigrammatic poems were written during the reigns of the Emperors Nero to Trajan, and the essential customs prevailing in Rome during this epoch of thirty-five years is undoubtedly truthfully depicted in his writings.

In an historical review of dental surgery taken from Kurt Sprengel's "Geschichte der Medicin," translated from the French of A. T. L. Jourdain, with critical and explanatory notes by A. Hockley, it is stated that the dentists of Egypt were paid regular salaries by the government from its treasury. While the government paid salaries to the physicians for the teeth, we are told that it was not illegal for them to receive fees for advice or attendance. They had to show that they had a knowledge of the principles governing the practice of this specialty gained from the experience of their

predecessors before they entered upon practice. Who determined the possession of this knowledge, and what standard of test candidates for practice were submitted to, does not appear. This authority also states the dentists of Egypt adopted the method long practiced in Europe "of stuffing teeth with gold, proofs of which have been obtained from some mummies in Thebes." It is also claimed by this authority that in a collection of Egyptian antiquities at Liverpool there are two pieces of artificial teeth, one of five teeth carved in bone, the other of two teeth of sycamore wood, and set in gold; and that "Dr. Purland has in his collection a tooth that is pivoted to a stump in the head of a mummy," and that Belzoni and others discovered artificial teeth made of sycamore wood in the sarcophagi of the Egyptians.

ETRUSCAN AND ROMAN ANTIQUITY.

Etruria embraced that portion of modern Italy lying northwest of the Tiber and south of the Arno. It contains many forgotten buried and plowed-over tombs erected by the Etruscans to honor and preserve the bodies of their people of distinction. Some of these, by the aid and under the direction of the Italian government, were exhumed and explored during the last quarter of the nineteenth century. The discoveries made have supplied indisputable evidence that this people, who lived here from about a thousand years to about two hundred years before the Christian era, had a high civilization and were well advanced in knowledge, wealth and arts. They also lead us to believe that they suffered from dental diseases and possessed skill in prosthetic dentistry. Where these Etruscans came from, and just when they came, is shrouded in doubt, and the time of their disappearance and whither they went seems uncertain also. It is certain that their era antedates that of the first known Roman who practiced upon the teeth. They became extinct before the advent of the Caesars. Their language is equally extinct, and archaeologists are said to be baffled at deciphering the inscriptions within these tombs.

The Museum of Corneto-Tarquinius, near Civita Vecchia, contains some specimens of prosthetic dentistry taken from a tomb near there, which is credited with having been built five hundred years before Christ. These specimens which are here reproduced were described by Dr. J. G. VanMarter of Rome, Italy, in an article published in the *Independent Practitioner* in January, 1885. He says:

"No. 1 represents the front view of an arrangement for holding in position

three superior artificial teeth, by banding them to adjoining natural teeth. In this drawing the cuspid and lateral incisors were natural teeth, while the two central incisors were evidently carved from some large animal's tooth to fit the space. Figure No. 2 represents No. 1 in a position to show the missing artificial bicuspid and the adjoining natural teeth, which had crumbled to dust when this relic of human misery was unearthed. No. 3 represents a partial denture which was taken from an ancient Roman tomb dating back four hundred years before Christ. The remaining tooth in this specimen was evidently a human tooth, as, no doubt, was the missing one. It represents the early Roman method of replacing two inferior incisor teeth on the Etruscan plan. No. 4 shows No. 3 reversed, giving a clear view of the position of the missing artificial tooth, with the manner of holding the same in position. The gold used in these specimens was very soft, evidently made so for the purpose of more easily slipping the rings over the natural teeth in adjusting the piece in the mouth. The two centrals in No. 1 were well carved and the dentures were cleverly made."¹

In the February number of this same journal for 1886 appears another article by Dr. VanMarter of Rome, in which he gives quite an extensive record of his search in various places of Italy for evidences of ancient dental practice and construction of artificial substitutes, and in which he mentions the recent opening of an Etruscan tomb at Capadimonti near the Lake of Bolsena. This tomb belonged to the sixth century B. C. and dates a hundred years further back than the discoveries at Corneto. Among its contents are gold spiral springs for side hair, silver finger rings, necklaces of amber and glass, arm bands, etc., "and three teeth bound together with a band of pure gold," which we reproduce as Figure 5. Dr. VanMarter states that the manner of binding these teeth together "is more primitive than the Corneto dental specimens and marks a distinctively earlier stage of pre-Roman dentistry.

"There is nothing to indicate that these three teeth are attached to any adjoining teeth," he continues, "and we were left to conjecture whether they were loose natural teeth, supported by the gold band, or if the cuspid were transplanted and held in position by the gold band around the lateral and bicuspid. It is not at all improbable that the bicuspid may have been a transplanted tooth, for we are sure in those earlier days they had very clever surgeons, and slaves were made to serve their lords and masters in any capacity, from building grand temples and monuments to supplying teeth for transplantation. The position of the teeth does not indicate that perfect

¹ See illustrations on page 16.

regularity and symmetry were the rule even in those early days. This is significant, when we consider that the former owner of these teeth was evidently a lady of distinction, judging from the ornaments and the contents of the tomb.

"Still earlier than this Etruscan specimen, I am assured by competent authorities, is the specimen of Phoenician dentistry, a sketch of which I send you herewith."

This sketch is reproduced as Figure 6. M. Ernest Renan describes it in these words:

"But that which was most interesting was the upper portion of a woman's jaw showing the two superior cuspids and four incisors united by a gold thread. Two of these incisors seemed to have belonged to another person and to have been placed here in order to replace the missing ones. This piece, which was found in one of the most ancient vaults, proves that the art of dentistry was pretty thoroughly advanced at Sidon, and also proves that the earth scurvy (*scorbut de terre*) so commonly seen in Sidon, existed already in those ancient times."

VanMarter continues:

"This piece of Phoenician dentistry may be seen in the Museum of the Louvre at Paris. It will be observed that this example of dental handiwork marks a still earlier period in the art of dentistry than the two other styles which I have already described."

He reasons that the art of dentistry must have been extensively practiced in the early history of the world and that gold must have been used largely because law fifth of the "*de Jure Sacrorum*" reads as follows: "If any one's teeth have been bound together with gold it shall not be unlawful to bury him with it" (the gold). These twelve tables of the law date from 477 B. C. and, as the Romans took their laws from those of Solon, the Greek, the origin of the statute probably dates to 625 B. C.

Rome for more than five hundred years after her foundation is said to have lived in ignorance of surgeons. Arcathagus, a Greek, is named as the first to make the attempt to practice in that city. They called him "Vulnerarius," healer of wounds, but later, when they learned of his free use of knife and cautery, they denominated him "Executioner," and he was banished from Rome.

It was about 100 years B. C. that another practitioner of medicine, Asclepiades, had the hardihood to settle in Rome. He began life as a rhetorician, failed, and proved a great success in medicine. He relied on diet.

friction, bathing and exercise, emetics, and bleeding, and "stroved to make himself as agreeable as possible to his patients." He is said to have enjoyed the friendship of Cicero and to have been a contemporary of Dioscorides, Cleopatra's physician.

At about the beginning of the first century Cornelius Celsus, whom they called the Latin Hippocrates, flourished in Rome. It is generally held that his works contain a complete exposition of what was then known of the art or science of medicine and surgery. He gives particular direction about the extraction of the teeth and urges them to be well shaken and loosened before attempting their removal. The vulcella,¹ employed by him for this purpose, probably furnished the idea for the hawkbill forceps of modern days. He recommended and practiced the scarifying of the gums, and the filling of carious teeth with lead and other materials.

Celsus, in common with his predecessors, was averse to tooth extraction by means of instruments, and recommended the use of the actual cautery, hot oil or caustic remedies, to effect their exfoliation. He employed gold wire for ligating teeth that had become loosened and which it was desirable to retain.

He also prescribed dentifrices and lotions for the purpose of fastening loosened teeth by astringent constriction of the gums.

Marcellus, who practiced in Rome after Celsus, equally discouraged tooth extraction, even in severe toothache, and prescribed cauterizing with boiling oil, also fomentations of opium or hyoscyamus. He mentions removing caries in teeth with a scalpel and filling the cavity with a gum or like material.

Fastening teeth occupied the attention of the practitioners of those days fully as much as their extraction. We must, therefore, infer that they suffered greatly from what is now called pyorrhea, which was first described as Riggs' disease, this American dentist having described and called specific attention to it in the last half of the last century.

Galen, who was the great surgeon of Rome after the middle of the second century, taught that the teeth are not entirely deprived of sensibility, as might be inferred from the absence of pain when they are filled, having proved on himself that the pain proceeds from the small nerves enclosed by the roots, and that the substance of the teeth may easily become inflamed, as denoted by the throbbing pain that is felt, the blackish color they acquire and the efficacy of antiphlogistics in removing these complaints. As the loosening of the teeth of aged people depends upon the parts surrounding the teeth, Galen indicates no other remedy than the strengthening the gums. With much

¹ See Fig. 1, Page 17.

sagacity he suggests that before attempting the cure of toothache an endeavor should be made to become acquainted with the cause of it, as, if that can be removed, the pains appease themselves. Dental caries, in a great number of cases, proceeds equally from internal causes. He extols as a remedy for toothache the use of vapor baths and the introduction into the tooth of a small piece of wax, pressed well in by means of a probe. He recommends opening, or trephining, the tooth when the pain cannot be appeased otherwise and, if finally it is incumbent to remove the tooth, he says it can be done without pain to the patient by the application of pirethrum root and strong vinegar, from the action of which the remaining teeth may be preserved by covering them with a layer of wax. At the expiration of an hour he says, the tooth becomes so loosened as to be easily removed, and it will also fall out by itself if placed in contact with sulphate of copper and strong vinegar.

Galen also tells how black hellebore, or ginger, inserted into the tooth, removes the pain, and prevents foetidity of the breath. When a tooth is loosened and projects beyond the level of the others, he recommends filing down the projecting part, for which purpose a small file was used, the tooth being held between the fingers, so as to prevent its being further loosened. As soon as the operation caused pain it was suspended and anodynes were administered. After the lapse of a few days the filing was repeated.

He, as well as his early followers, continued to employ the grotesque, if not frivolous, formulae for nostrums styled dentifrices. "The ashes of burnt mouse dung and of burnt angle worms" seem for a long time to have been greatly appreciated as essential ingredients for a dentifrice. Coelius Aurelianus, who lauds their efficacy, entertains the same aversion to tooth extraction as his predecessors, but gives as his reason the fatal results from this operation. He advocates the use of extracting instruments made of lead, and the methods otherwise already mentioned. He speaks in criticism of the plugging of teeth with iron.

Galen transmitted several formulae for dentifrices written in verse, announcing that they were composed of the finest drugs of Arabia. "It is an excellent powder," he writes, "very fine, which has the property of whitening the teeth, causing the disappearance of the swelling of the gums, and of removing that which adheres to them so completely that no cases of tartar can be seen, even when the gums are exposed by laughter."

Scribonius observes that many believed that there was no better remedy for toothache than extraction, but that it was not necessary to proceed at once to extraction even though caries existed. "for by removing the decayed portion

of the tooth with a sharp cutting instrument, such removal causing no pain whatever, the remains are as sound as a healthy perfect tooth." He declares loose teeth may be tightened by a decoction of patience-root in wine or ass's milk.

Marcellus of Bordeaux recommends the use of amulets and other superstitious means. Here are some of his treatments:

"When a tooth, which is loose or painful, is to be extracted, the nose of the patient should be rubbed with brown sugar, ivy or green oil. He is advised to hold his breath, a stone is then placed upon his tooth and he is made to close his mouth. The fluid which causes the pain is then allowed to flow from the mouth in such a quantity as to frequently fill three pots. After having cleaned the nose with pure oil and rinsed the mouth with wine, the tooth is no longer painful and may be easily extracted. The tooth will likewise drop out by itself if it be rubbed with African sponge. It is only necessary at the return of the swallow, to repair silently to the border of a clear rivulet, take some water in the mouth, and to rub the tooth with the forefinger of both hands, and repeat these words: "*Hirudo, tibi, dico, quo modo hoc in nostro iterum non erit, sic mihi dentes non dolant toto anno.*"¹

SAINT APOLLONIA THE PATRON SAINT.

Saint Apollonia, in the year 300 A. D., was canonized by the church of Rome, and since then has been the patron saint of dentistry. The ninth day of February has been observed by the church of Rome in her commemoration. A painting of this Saint was, in 1900, presented to the Academy of Stomatology, on behalf of Dr. Mary H. Stillwell, by Dr. C. N. Pierce of Philadelphia, together with this historic sketch:

She was the daughter of a heathen magistrate in the city of Alexandria. Her mother, although not a Christian, was inclined to look with sympathy on the believers in that faith and often spoke to the child of the wonderful power there was in the prayers of these people. It is not surprising, therefore, that Apollonia, as she grew up, felt more and more deeply that this alone was the one religion that could satisfy and ennoble her life. Longing to obtain the grace of baptism, she made her way to Saint Leonine, a disciple of St. Anthony of Egypt, and, as he baptized her, he bade her go to Alexandria and preach the faith. So she went forth, and though she was only a woman, young and frail, yet so eloquent were her words, so fervent her

¹ A liberal rendering of this invocation to *Hirudo*, the bloodsucker, may read:

Leech, I implore you let me not repeat this remedy and let not my teeth ever ache again.



SAINT APOLLONIA.
By courtesy of Dental Cosmos.

zeal, that she made many converts. About this time a tumult had been stirred up in the city against the Christians and the mass of the people were enraged at her teaching, and came with bitter complaints to her father. He gave her up to be judged by the governor. They brought her before the idol temple and bade her worship the graven image. It is reported that she made a sign of the cross, and there came forth from the statue an evil spirit shrieking, "Apollonia has driven me hence." This was more than could be borne; the people thirsted for vengeance, so they tried by torture to overcome her constancy. She was bound, and one by one her teeth were drawn out, but still she did not flinch or fear, and on her refusal to accede to the demands of her persecutors and renounce her faith, she was brutally clubbed about the head and face, and subsequently suffered death by fire.

For a period of nearly fifteen hundred years her intercession has been sought for relief from all pain incident to dental diseases, and her relics have been and are regarded as possessing great efficacy in the cure of the same.

Remains of her head and jaws, which were gathered from the fire in which she was thrown, are said to be preserved in various churches. In Rome, in Naples, in Antwerp, Brussels and Cologne portions of the bones or teeth are cherished. There is also a portion of these resting in some of the churches in the province of Quebec.

Chapels and altars in her honor are found in many churches. Her distinctive emblems are the pincers and tooth, the latter in some of the paintings is hung by a gold chain around her neck as an ornament.

Another story is that St. Apollonia suffered martyrdom at an advanced age in Alexandria during the Decian persecution, 249. She was seized, together with other Christians, and received such violent blows upon her jaws that she lost all of her teeth. The Pagans then lit the pyre, and demanded that she should curse Christ. She hesitated for a moment and then suddenly leaped into the fire. During the middle ages she was worshipped as the patroness against the toothache.

The progress of all science and art, including that of medicine and surgery, was very seriously interrupted for a long period after the decline of Roman world influence in the fifth century.

THE SARACENS AND ARABIANS.

The great center of learning had for ages existed at Alexandria in Egypt. Here was located the greatest library of the world. When the Saracens invaded and conquered it, about the middle of the seventh century, they almost entirely destroyed this library. Their religion led them to believe that if these books taught no more than the Koran, they were useless, and if they transcended the Koran they were blasphemous and should not be permitted to cumber or pollute the earth. Later, however, their chiefs espoused a differing view with regard to the perpetuation of the recorded wisdom of the preceding ages, and about a hundred years after the destruction



Fig. 1



Fig. 2.



Fig. 3.

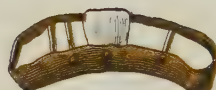


Fig. 4.

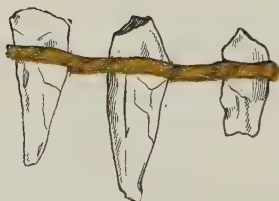


Fig 5.



Fig. 6.

FIGURES 1 to 5 ETRUSCAN, FIG. 6 PHOENICIAN DENTISTRY.
(See Pages 8 and 9)

DENTAL INSTRUMENTS OF ANTIQUITY.



Fig. 1

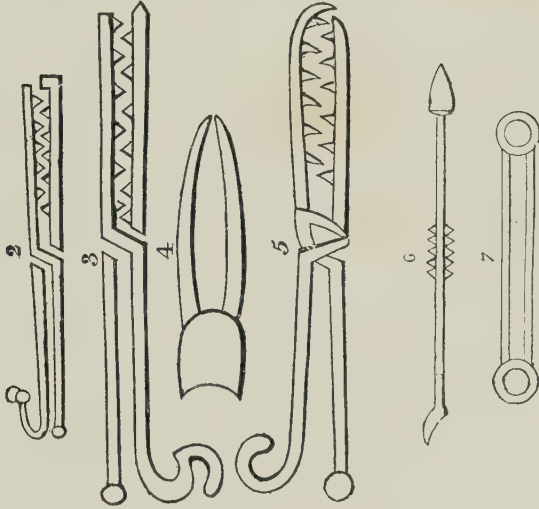


Fig. 6

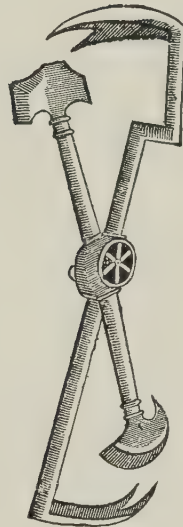


Fig. 8

1 Vulcella of Celsus. (See Page 10.) 2 to 8 Arabian Instruments. (See Page 18.)

of the Alexandrian library, translations of Egyptian, Greek and Român books were made into Arabic and Syriac. For hundreds of years the practices, writings and teachings of Hippocrates, Celsus, Galen and the other early writers, Greeks and Romans, were thus preserved. But as the religion of Mohammed forbade the handling of the dead human body, the study of practical anatomy was impossible. The surgeon's profession was under especial contempt, owing to the religious and social prejudices, and all surgical operations had to be performed by the physician's servants, or slaves, so as to protect the physician himself from the involved defilement. No wonder that surgery sank to a low condition of esteem.

Aetius, a Greek physician of Arabian birth, who studied at Alexandria and who lived in the fifth or sixth century, recommends filing the teeth. He describes a file invented by him for this purpose, having a rounded head in order to avoid lacerating the soft tissues, he urges great care in its use, and he is said to have spoken as though he was the father of this operation. He discovered that teeth were open at their roots and had nerves that came from the tri-facial system.

Abulcasis, another Arabian, wrote in the tenth or eleventh century to free surgery from this contempt, and to liberate it and rescue it from the hands "of impudent and audacious barbers" who frequently did great mischief. He practically repeats the methods advocated by the earlier writers. Some of the instruments he employed are here pictured. Figure 2 is an instrument for shaking the teeth. Figure 3 is an instrument for extracting properly loosened teeth, and Figures 4 and 5 are substitutes for the vulcella of Celsus, used for the removal of portions of bone, of jaws or of roots of teeth. He also described a variety of hooks, levers and other instruments. His description of technical procedure in extraction is certainly interesting. He says: "The head of the patient should be taken between the knees of the operator, in order to keep it steady," if the tooth does not readily come out, a kind of lever should be inserted under it on all sides, so as to raise it a little, before again attempting its extraction." Figure 6 is instruments to be used in the application of the actual cautery. Figure 7 is a file used by him, and Figure 8 represents the earliest type of turn key—employed for the extraction of teeth.

He describes particularly the use of gold and silver wire in fastening loose teeth, or in fastening replanted teeth. He is credited with having been the first to recommend replanting teeth when one or more teeth had fallen out as the result of an injury. Thus we learn that replanting of teeth was

practiced at least nine hundred years ago. He also described scaling or scraping instruments. Artificial teeth carved out of bullock's bones were made by him and fastened in place by means of gold wire. Filing the teeth is fully described by him as a newer operation in dentistry.

As the Saracens had superseded Greek and Roman, so in their turn came the Turk to destroy and succeed them. The middle of the thirteenth century established the supremacy of the Ottoman Empire and Palestine was made a possession of the Turk.

This led to the wars of the crusades, waged for the purpose of restoring the Holy Land to the possession of the Christians.

These wars, like many others in the world's progress, brought in their trail results not intended or contemplated at their outset. The Holy Sepulchre and the Holy Land were not restored to the dominion of Christian nations and Christian knights, but the soldiers who returned to their homes in western and northern Europe carried thither much information upon the knowledge and the arts of the east. Medical practice during these days had been almost entirely monopolized by the monks and friars among the Christians. The Jews during the last part of Arabian ascendancy were the travelers in distant lands and looked after mind, body and estates of their neighbors. As a result surgery at this period had retrograded almost to its incipency of the days of the early Greeks, and was confined to very narrow limits.

Whatever was practiced in this respect was left to the hands of "farriers, barbers and swinegelders." So far as military surgery was concerned, the days of Aesculapius seem to have returned, and the wounded hero might either extract the foeman's dart himself or let the dexterous hand of his lady love perform the deed.

AWAKENING OF WESTERN EUROPE AFTER THE CRUSADES.

The change of Constantinople from Roman control to that of the Turk, in 1450, resulted in the expatriation from their native land of many Greeks of great learning, who fled to the west and became teachers of their arts and sciences, and laid the foundation for the development of a new civilization in Europe. The Universities of Italy and Spain, of Paris and of Oxford, began to secure professors of worth and the fifteenth century made rapid strides forward. Fallopius, Eustachius and many others made real discoveries in anatomy and corrected the errors of former teachers. A new era of original research was ushered in and it became necessary to specialize, and oculists, aurists, den-

tists and others developed. To Fallopi, who taught at the Universities of Pisa and at Padua, and to Eustachi, who taught at Rome, the world is indebted to the first consecutive and reasonably correct description of the human teeth. Fallopi discovered and described the dental follicle, which was further exemplified and described by Eustachi, who, in order to leave no room for doubt, is said to have dissected many fetuses. He it was who first gave an account of forms, structures and uses of the teeth during all periods of life.

As early as 1308 the barbers of London were incorporated into one guild with the surgeons, and the English name of barber-surgeon for several hundred years embraced the practitioners of all special branches of surgery. The title of "Doctor" was invented in the twelfth century at the first establishment of the universities, and indicated a learned man in any science. William Gordenia was the first person upon whom the title of the Doctor of Medicine was bestowed. He received it from the college at Asti, in Italy, in 1329, whether in course or honorary has not been ascertained.

THE SIXTEENTH AND SEVENTEENTH CENTURIES.

These investigations and demonstrations led to greater attention to the study of the diseases of the teeth, and, the art of printing being now available in the dissemination of knowledge, resulted in the first published works devoted to the structure of the teeth and their diseases. Among these was one published at Lyons, in 1581, by Urban Heman, surgeon of the Cardinal D'Armagnac. He evidences a study of comparative anatomy and sound physiological observation in the statement that man must of necessity have combined all the kinds of teeth which distinguish other animals, since he is to feed on all the kinds of foods on which the other animals severally subsist.

Notwithstanding the fact that many distinguished specialists in surgery made their mark at this period—Berrenger, at Padua, in the surgical treatment of the head; Ingrassias, at Palermo, in surgery of tumors; Mariano, at Naples, in lithotomy, and Ambroise Paré, to the treatment of gun shot wounds, which had now become a new condition in civilization's progress—and many of the old methods of treatment gave way to new ways, surgery as a whole was not looked upon as a very exalted calling.

The minor operations everywhere in Europe were relegated to the care of the barbers. Dental surgery being embraced under this head, there were no dentists then as specialists, except in so far as the barbers cared for or removed teeth.

The Paris surgeons for redress against this degraded condition of their profession appealed to the Faculty of Medicine, toward the end of the fifteenth century, which resulted in permission to enjoy certain distinctions over the barbers upon paying an annual tribute to the Faculty of Medicine amounting to sixteen sous. In 1505 the barbers and physicians of Paris entered into a compact by which, for certain considerations, the barbers were admitted as members of the medical faculty, and their title changed to "Tonsores Chirurgici," instead of "Barbi-Tonsores." The surgeons galled under this domineering of the physicians for ten years. Then they took an appeal to the University of Paris, and secured authority to form a college of their own, with the power of creating Masters, Bachelors, Licentiates and Doctors of Surgery. In spite of constant trouble with the physicians, the surgeons enjoyed their independence. In 1596 they promulgated a rule against the barbers, compelling them to call a surgeon in all cases of importance and to circumscribe the field of their operations to the trivial cases. Under this rule the barbers probably continued to be the dentists.

During the seventeenth century there occurred all over Europe an awakening in the direction of scientific investigation and experimentation. The mysticism and empiricism of the ages gone before were being questioned, and propositions or discoveries in the realms of the experimental sciences were measured and proven before they were accepted. This led to the organization of academies of sciences in nearly all the countries of Europe for the purpose of bringing into closer relations the discoveries, explorers and investigators of the time. Much new thought and original research very soon compelled men to confine themselves to smaller areas of special work, and the beginning of what may be called the renaissance of the Egyptian ways—a division of labors and specialists in all professions—may thus be placed as from 1660 on. •

Dentistry, as the result of this specializing in research, began to attract the attention of some medical men, and while the title "Surgeon Dentist" was first given in 1622 to several men in France, notably Gillies, it was not fully established for many years after. B. Martin, who wrote a work on the teeth in France in 1670, was called an apothecary, presumably in contempt, by Fauchard.

In Germany what may be called dentistry was not unknown in the sixteenth century. Peter Jordan, at Mayence, published "a treatise upon all kinds of infirmities and diseases of the teeth" in 1532. This is taken largely from the books of Galen, Avicenne Mesue, Celsus and Pliny, "with brief and useful

instructions, how to preserve them in good health and to extract the bad ones and their roots, *easily, safely and without pain.*"

In the preface to this work the publisher remarks: "The Lord Almighty, who is cognizant of everything from its very beginning, in his inexpressible wisdom, ordained, not vainly, that the teeth of brutes, as well as of mankind, should be the first preparers of food so that nature might be assisted in preserving the race. * * * But the teeth are not only preparers of food, but are also given to mankind for speech and for ornament, particularly the front ones, which receive and echo the impulse of the tongue in sweet sound, or, as Pliny has it, *create order and sweet civility.*"

This little book contains thirteen chapters, it is full of quaint remedies and perpetuation of the empiricism of the ages that preceded it. It concludes with the moralizing observation that "when adversity or ill luck attend, a haughty spirit, magnificence, and pride disappear."

Later, in 1559, a book, "Zeen Artznei" (tooth doctoring), was also published in Germany, but the author's name is not given. It is in its matter so much like the one published by Peter Jordan, in 1532, that it may have been a second edition of this. It contains many curious observations.

The first chapter treats of the number and growth of the teeth and relates that the distinguished Roman, Marcus Curius, was born with fully developed teeth by reason of which he was named Dentatus. After giving the appearance and order of first dentition, the author refers to a number of cases of third dentition, one in a man 104 years old who had lost all his teeth. He also relates the case of Thimarcus Nicoelis, who had two rows of lower jaws, in each of which he had teeth.

In a chapter entitled, "How to help the children so that their teeth may grow easily," this German author observes that the period when the teeth begin to grow, during the seventh month of life, is frequently accompanied by sicknesses and great pain, for the remedy of which he recommends, that such children should receive frequent baths, after which the gums should be rubbed with a finger that has been dipped in warm chicken, goose or duck grease, and that this rubbing and pressing should be continued until the eruption of the teeth. He also recommends for the same purpose the use of hare's brains alone, or mixed with the fats before mentioned; also that these nostrums in some cases be applied externally upon the cheek. As soon as the teeth begin to appear he recommends that sheep's wool, taken from the neck of the animal and dipped in warm oil of camomile or dill, be applied upon

the neck and chin, "which is very soothing to the children and aids the growing of the teeth." He further says:

"It frequently happens that when, in the seventh year, the teeth of children begin to drop out, the new teeth grow along side of those that should fall out. In such a case the old tooth should be well separated from the gum and frequently shaken until it becomes loose enough to remove. After that the new tooth should be daily pressed in the direction of the tooth that has been removed until it has taken the place formerly occupied by the other one and if this is neglected the tooth will become black, and it can never grow straight, and there is no way by which it can be put in its proper place afterwards."

The chapter entitled "Pain of the Teeth" relates among other things the author's opinion "that no greater pain has been discovered than this is." This is a milder form of stating it than that employed by Robert Burns, who described it as "the hell of a' diseases." This difference of statement we do not believe is due to any increased intensity of the sensation between the sixteenth and nineteenth centuries, but it may be indicative of the more forceful manner of expression afforded by the English language over that of the elder Germans.

Our German author further proceeds with a description of the causes of toothache, and ascribes it to a bad complexion or disturbance of the veins which enter into the teeth. He also states that it is one of the hereditary diseases which are transmitted from father or mother, and supports the truth of this claim by the statement that it has been well observed that those children are most afflicted with toothache both of whose parents had suffered from this disease.

He quotes Joannes de Vigo, the Genoese, as recommending three methods of stilling this pain. The first is a regimen of eating and drinking which will avoid anything that will easily decompose, decay or become of offensive odor such as milk, old cheese, fish, meats and the like. The next is to cleanse the teeth of all materials which can create the pain, which can be best accomplished by blood letting and cupping. He recommends opening the larger veins, or those of the lips and the dark veins under the tongue, cupping under the shoulders, under the neck, on the chin, and scarifying the gums to deplete the vessels from an excess of blood. He also recommends purgation by means of Mesue's *Electuario rosato*, pills of rhubarb and other remedies. He further states that the use of medical remedies is advisable, which should be of two kinds, "those that quiet the pain caused by heat, and those that quiet the pain that has been occasioned by cold." If pain is caused by heat,

he wisely recommends that it may be relieved by the application of "cold things," and when the pain originates from the cold he declares it is very much assuaged by taking something "warm in the mouth."

Here are some of his prescriptions, for toothache caused by cold: "Take ginger steeped in vinegar and hold it in the mouth while warm; or take pepper and euforbium powdered and mix it with honey and apply this upon the teeth; or take asafoetida and mustard mixed well together, which is also good; or take one-half peach kernel and one-half pepper, grind these together finely and apply this to the tooth. There are numerous other remedies for this class of toothache." Then the author recommends remedies for toothache caused by heat, among these he prescribes: "Take the skin of a snake, steep it in vinegar and hold it in the mouth, or instead of the vinegar employ the wine of pomegranates."

For shooting pain in the teeth this is the prescription: "Take pepper, incense, burnt beans; reduce them to powder; mix them with white of an egg; make into a plaster; spread this upon a small piece of cloth and apply it on the inside of the cheek on the side where the pain is; or take the broth of frogs, boiled in water with vinegar, and hold this in the mouth."

He further observes that when the cheeks begin to swell "is an indication of the cessation of pain, the materials that caused the pain having left the veins that enter the teeth and the membrane or skin which comes from the brain and surrounds the teeth, and have gone to the external fleshy parts, the cheeks." He next describes "corrosio" as a disease and fault of the teeth which makes them full of holes or hollows, mostly affecting the back teeth, especially when after eating they are not cleaned of particles of food that adhere to them. "This becomes decayed and creates a bad offensive moisture, which etches and eats into the teeth and gradually gains the upper hand until the teeth are entirely destroyed, not without creating pain, however," he writes. As a prevention for decay, he prescribes that the cockle weed, which grows among rye or wheat, be steeped in vinegar and held in the mouth.

FIRST REFERENCE FOUND TO GOLD FILLING.

He also recommends that the decay in the cavity be removed, in one of two ways. The first is that the cavity be cleaned with a suitable instrument and knife and "*be filled with leaves of gold*;" the other is that medication be employed, such as gall apples, galbanum or opopanax.

Jean Arculanus, who was a professor in Bologna, early in the sixteenth cen-

tury, is credited with being the first one who mentions the use of sheets of gold for filling the teeth, but is not given credit for having been the first to employ it for that purpose.

The author also observes that people who will place salt upon their tongue every morning and hold it there until it dissolves will not have hollow teeth. He speaks of teeth being "on edge," sometimes by exterior and sometimes by interior causes. As exterior causes he names sour foods taken into the mouth like sauerkraut, sour apples, pears and other sour fruits; and as interior causes the rising of bitter or sour moistures from the stomach, and the gases that enter the mouth and lodge between the teeth and upon the gums. As a remedy for this difficulty he recommends the eating of nuts such as walnuts, hazlenuts, almonds—or of rubbing these up and applying upon the teeth. The chewing of the seeds of portulaca is also recommended, as is also warm bread, toasted cheese, the yolk of an egg, a little salt, all rubbed together and applied upon the teeth.

He refers to yellow and black teeth which, he says, are caused by the deposit of a slimy substance upon the teeth and gums which by some is called "weinstein" (tartar). He describes this condition to the use and eating of honey and other over sweet and fat foods, and he observes that he "who desires to retain white teeth must abstain from honey and from sleep after heavy eating." The natural form and condition of the teeth can be retained and restored by scraping and cleaning them, he continues, for which he recommends the use of pumice and other materials. For black teeth he recommends scraping, and "the rubbing and coating with an ointment composed of roses, gall apple and myrrh." Another remedy of his for cleaning such teeth is the shells of unboiled eggs and brick dust pulverized into the finest powder, which just before using, is placed in a spoon and wine or vinegar poured over it. The tooth is then rubbed with this mixture, after which the mouth is rinsed with wine or luke warm water.

To cleanse blackened teeth, restore loose ones and to create a sweet odor of the mouth, he prescribes the following powder: "Take burnt alum, cream of tartar, red coral, pumice, and charcoal made from rosemary and cypress stems, sandal wood and sarcocolla, make all into a powder and rub the teeth with it."

The German author describes a condition of the teeth under the name of "*dormitatio*," as a similar sensation to the "going asleep" of hands or feet, which he says is the result of taking into the mouth very cold things, such as snow, ice or cold water. The remedy suggested is a mouth wash composed of

rosemary, salvia, camomile flowers, cloves and mace, steeped in good wine until the whole quantity is reduced to one-third; this to be held in the mouth while warm and the teeth rinsed.

The next dental difficulty mentioned is "*dentium commotio*," which is described as a loosening of the teeth and a premature dropping out of the same, which he says is the result of carelessness, weakness, or disease of the gums and the deprivation of blood from the thing that holds the teeth.

When this loosening occurs as the result of local or internal disturbance, he recommends the use of constitutional and local remedies, but when the loosening is the result of a blow or fall he recommends a ligature of silk or gold wire attached to the firm and uninjured teeth, and counsels the use of soft foods. He quotes the recommendations of Cornelius Celsus of medicines that harden and contract the tissues, and especially recommends the use of "wine in which burning gall apples have been dropped and extinguished." As a substitute for this he recommends the ashes of burnt deer's horn, which he says can be used either by rubbing on the teeth or to rinse the mouth with, and the teeth will grow firm. The shavings of deer's horns used in like manner, he claims, have equal efficacy. Olives boiled in water and olive oil used as a mouth wash are also recommended.

The author then proceeds to describe worms in the teeth and gives the following prescription: "Take mushroom seed, garlic seed and onion seed; boil these together in vinegar, hold this in the mouth and rinse it. After this take these same seeds, powder them and pour over it fat that is taken from near the kidneys, make little cakes out of these as large as beans, then place one of these cakes on burning coals, put an inverted funnel over this and let the smoke enter into the mouth, and that will kill the worms."

The next chapter is devoted "*to boils, mal-odorous and disintegrating gums*." For the treatment of a boil he recommends that it be pressed with the finger, and if this is not sufficient to cure it, that a suitable, small, sharp hook be introduced, "the filth thus removed and the mouth then rinsed with vinegar or wine in which honey and salvia have been boiled." If the gums have an offensive odor, he recommends that "cinnamon, cloves and incense be rubbed upon the teeth," and for the putrifying gum he recommends a mixture of alum and honey with which the tissues are to be painted, and in case the condition does not yield to this treatment he recommends constitutional treatment with purgatives.

The author next considers extraction of the teeth and remarks: "If the pain cannot be stilled in any manner heretofore considered, and if the keeping

of the offending teeth threaten injury to the other teeth, the last resource to be admitted is extraction. This operation should be performed by one well experienced, as the extraction of a tooth by an inexperienced person cannot be performed without injury." He further observes, "Extraction must not be resorted to excepting that the pain has begun to abate, when the master may proceed with a suitable instrument to make the tooth free from the gum, so that when the tooth is removed, the gum may not be pulled also and thus that other disease may not be caused. After the gum has thus been dissected away, the tooth should be shook hither and thither, after which, having become loose, it may be gently and not hurriedly removed, so that the jaw may not be injured or broken or dislocated, as occurs occasionally with the inexperienced; and that, as may occur with the upper teeth, there shall be no injury inflicted upon the eye." He also recommends that before extracting, if the tooth is very much decayed, it be first filled with lead, tin, silver or iron or anything else that is practicable, so that "when the tongs take a hold, it should not crush." After extraction he recommends "a thorough examination of the tissues to determine that no fracture of the alveolus or jaw has occurred," and "in the case that a spiculum of bone has been displaced it must be removed to prevent serious injury and swelling and suppuration." If the extraction has proved without injury to the surrounding tissues, he recommends the use of a lotion of vinegar in which gall apples and pomegranate flowers have been macerated.

"Some," he says, "have an aversion to the extraction of the teeth and prefer to burn the offending tooth. They take a fine iron which is adapted for this purpose. This they heat to a glow, then they place this through an iron tube, through which the glowing iron passes, and introduce this into the offending tooth while the cold case protects the other tissues. In the case of a much decayed tooth, the red hot iron is introduced into the decay. This burning is very efficacious and not dangerous, it subdues the pain and the tooth breaks to pieces and disappears without further pain." He further observes: "Some, instead of extracting and instead of using the actual cautery of iron, use a little olibanum (Juniper Lycea), make that into a glow and place it in the hollow of the tooth; or they take the fat of a tree toad and anoint the teeth with it, which causes them to break and eventually to drop out without further pain."

The last chapter is devoted to the retention of the teeth. He sapiently remarks:

"Who desires to retain good teeth must avoid the things mentioned in the

previous chapters. He must each morning, as soon as he rises, take a coarse piece of linen and rub his teeth inside and outside and cleanse them by a rubbing once or twice, such rubbing strengthens the teeth and the gums and prevents decay. After this he should take salt and rub the teeth; this will secure them to be white, fresh, firm and healthy. Or he may take salt and honey mixed, burn it to a powder, and with this powder rub the teeth; or he may take myrrh and alum, powder it and rub the teeth together; or he may take burnt alum, dissolved in vinegar, and wash the mouth with it. He may also take myrrh boiled in wine as a mouth-wash, which strengthens the teeth, prevents the gums from receding, the forming of bad odors and putrefaction."

Finally he says: "Always after eating *wash the mouth with wine or beer* that there may be washed off everything that might adhere to the teeth, which may make them decay or create bad odors."

AMBROISE PARÉ, FATHER OF MODERN SURGERY.

Ambroise Paré began his career in Paris, about 1525, as an apprentice to a barber surgeon. His great skill and ability while still a young man caused the commander of the French forces in the Piedmont campaign of 1537 to take an interest in him, which resulted in his appointment as master barber surgeon. This service gave him opportunities to introduce experiments and reforms in the practice, which deservedly resulted in the bestowal upon him of the title of the "Father of Modern Surgery."

Upon his return to Paris he was ridiculed, vilified and maligned, but having the support of the men in power on his side he paid little heed to that. He proceeded not only to reforms in practice, but also insisted that every surgeon should be educated in anatomy by dissections and that all should have a systematic medical training, and he instituted schools for their instruction. He wrote a number of works on various branches of surgery. In his work published in 1597 he states that the adherence of the teeth to the jaw is caused by a ligament which goes from the root of the tooth to the jaw. He believed that teeth continued to grow during the life time of the individual and that they could distinguish taste. He expressed a belief that frequently in the extraction of teeth three good ones were removed before the decayed one was touched. The instrument which he used for extraction was the pelican. He is also credited with having been the first to close perforations in the palate by means of obturators.

In an edition of his work, published in 1634, this is written:

"I heard it reported by a creditable person that he saw a lady of the fine nobility who, instead of a rotten tooth she drew, made a sound tooth, drawn



from one of her waiting maids at the same time, to be substituted and inserted; which tooth in process of time, as it were taking root, grew so firm as that she could chew upon it as well as upon any of the rest. But as I formerly said, I have this only from hear say."

Dr. William H. Trueman in writing of Paré says: "He lived to see his work appreciated, his methods generally adopted and the science he loved placed fairly upon a scientific basis, and died in 1590, honored and respected by all. The work so well begun went steadily on, and toward the close of the seventeenth century the surgeon and the dentist had so far separated from and advanced beyond their former companion, the tonsorial artist, that they began to claim an equal standing with the profession of medicine, and after a vigorous struggle they gained their point. During this contest the dentist and the surgeon fought for their rights side by side, and at its conclusion, in France, the physician, surgeon and dentist became professional brothers. There and then, possibly for the first time since the dark ages, dentistry assumed the place she has since held, ever recognized and unchallenged, a science among sciences."

Paré was an earlier Fauchard or Hunter, or they were later Parés. These three men builded the foundation upon which the present great superstructure of the science and art taught and practiced by the dental profession of the world has been reared. Their labors from 1525 to 1793 made possible the progress of modern days, which took its new impetus in this country with Harris, Hayden, Taylor and others, in 1839.

Guerini tells us that in 1593 the miraculous case of a golden tooth in the mouth of a seven year old child in Silesia greatly attracted the attention of the learned men of that period, but this tooth was proven later to have been only a natural tooth skillfully covered with a gold band. He says: "In consequence we can affirm that this gold crown was made in 1593; not with a therapeutic end, but for the purpose of deceiving the people, for the child's father demanded a contribution from every one who desired to see the child."

In a book entitled "Helkiah Crooke Doctor in Physicke," published in London, in 1618, occurred the following:

"That they (the teeth), are bones some men do deny. First, because bones are insensible, the teeth sensible. Secondly, because the bones have certain limits of action or increase, neyther do they ever grow againe if they perish, but in teeth it is quite contrary. Thirdly, because they are harder than other bones. Fourthly, because bones exposed to the ayre do grow blacke, whereas the teeth do keepe their whiteness * * * Fnally say they there is a stone that will consume fleshe, called therefore "Sarcophagus," which within forty days will devour the whole body except the teeth. If, therefore, the teeth were of the nature of bones, they also would be consumed.

"They were made very hard that they might not weare so soone or be broken in chawing or breaking of hard things, for they are not lined eyther with fatte or gristles as other ioyns are to hinder attrition. The teeth, therefore, do breake bones, resist the edge of steel; neyther can they easily as other parts of the body be burnt with fire. Hippocrates, in his booke "*De Carnibus*," ascribeth the cause of their hardnesse to the quality of the matter out of which they are ingendered, for hee writeth that out of the bones of the head and the iawas there is an increase of a glutinous matter. In that glutinous matter the fatty part falleth downe into the sockets of the gums where it is dried and burnt with the heate, and so the teeth are made harder than other bones because there is no cold remaining in them."

LEEUEWENHOEK, in 1678, discovered and described the tubular structure of the dentin. He had one of his own teeth drawn and, in conjunction with several gentlemen, examined it by the means of strong glasses. They agreed that they plainly saw the whole tooth was made up of very small, straight and transparent pipes. Six or seven hundred of these pipes put together, he believed, did not exceed the thickness of one hair of a man's beard. These statements were so new and beyond the conception of all others that no particular attention was paid to them, but in the light of present knowledge this early discoverer was certainly entitled to credit for his painstaking, original investigation and discovery.

THE EIGHTEENTH CENTURY—AUGUSTI BUDDEL.¹

France, in 1700, was the first country to recognize the importance of dentistry as a distinct profession, by requiring prospective practitioners in this specialty to submit to an examination.

Berdmore, in 1723, gave considerable attention to improvements in the construction of artificial teeth and their adaptation. Fauchard, in 1728, published the results of his forty years' experience as a dentist. He was among the first to remedy the defects of cleft palates by means of mechanical obturators. Brunon wrote an accurate description of many of the diseases of the teeth in 1741, and proved that the prejudice against the extraction of the teeth, and particularly in pregnancy, was not to be encouraged.

Bourdet, in 1757, was credited as having been among the first to undertake

¹ Royal court counselor and body physician, director of the College of Medicine, of the Royal Society of Sciences; professor of anatomy and physics and the Medico Surgical College, and member of the Imperial Roman Academy.

the insertion of a full upper and under artificial denture, and to retain the same, although the work of Fauchard, published in 1728, clearly entitles the latter to this distinction.

The position that dentistry had assumed early in the eighteenth century and the progress made in its scientific development are probably best portrayed in a book entitled "The French Dentist," published in two parts at Paris by Pierre Fauchard, in 1728, and which was translated into German by Augusti Buddei, and published at Berlin, in 1733.

This book represents what dentistry was in France at the time, and the preface written by the translator, which is quite extensive, equally clearly defines what progress dentistry had then made in Germany. The translator observed :

"The peculiar greed with which the newly issued surgical literature of France had for some time been received in Germany especially explains the assiduous efforts that have been made to translate the same into our language. The natural impulse to become interested in anything that is new is almost universal, and this may have contributed considerably toward the kindly reception of these French writings. Thus curiosity is not injurious or to be depreciated. It is beneficial and should be encouraged in so far as the promotion of the healing sciences is its ultimate aim. The true worth of a thing never consists in its appearance, but in that which it contains and in its completeness. It is equally of value whether old or new, or in whatever language or tongue it is brought to the attention" (market).

"Some are satisfied with anything that is new; others act as though when anything new is presented by a nation which appears at the time to be in possession of this or of that science which it has established or exploited, or in which it has made a particular reputation, that there is no further use for investigation and they satisfy themselves easily with a favorable prejudice.

"One should be thoroughly conversant with and understand the subject upon which one is to pronounce an opinion, and should obtain such manner and measure of light and insight as to warrant a decision; the more thorough the investigation the more reliable must be the conclusion.

"It can be said with truth that this book is the first of its kind, and its author the first who has begun to treat this part of surgical diseases in a systematic and circumstantial manner. There has been no lack of French surgeons who have presented and described various operations, instruments, bandages and all other matters belonging to the so-called system or *cursu operationum*, nor of such who have treated in extensive detail upon surgical

operations and everything connected therewith. In these we find described trepanning, eye and ear diseases, lithotomy, rupture, accouchment, fistula, amputations, etc., and the instruments and bandages employed. With all this it is surprising that not any one had been willing to busy himself especially with the teeth and their diseases, as the mouth and the teeth enclosed within are as clean and sweet as the other parts of the human body upon which operations are performed.

"Presumably the cause or reason for this may be found in the fact that extraction and cleaning of the teeth are considered indecorous. While operations for cataract, hairlip and cancer were rightfully taken away from fraudulent charlatans and embodied in honest surgery, it was not to be thought of to do the same with the diseases of the mouth and teeth.

"If some be found who look upon the diseases of the teeth as of little importance and who, therefore, do not consider it worth their while to direct their care or attention particularly upon them, they thereby establish especial proof of their poor knowledge of anatomy and pathology of these parts.

"This alone is to be remembered, that where a portion of our body is inclined to pain, the same may be traced to the teeth so long as they remain in their alveoli and are covered by their membrane. Although the teeth are the hardest part of our body, and therefore little subject to treatment, they must in certain cases be burned (cauterized), filled, filed, tied together and finally extracted, through the skillful hand of the surgeon.

"While to our author belongs the honor of having with praiseworthy industry, excellent wisdom and useful application, presented to our view an ordinary compendium of the anatomical description, diseases and remedies of the mouth and teeth; instruments and entire apparatus necessary thereto, which nobody had done before him, there have not been wanting in olden or newer times writers who now and then have treated somewhat upon the teeth.

"In this class of writers belong the disputations upon the teeth by Thomas Erasti and Melchiores Sebizzii, the first published in Zurich, in 1595, and the other in Strassburg, in 1645. Others, on the other hand, have written upon dental diseases in a haphazard and incomplete way," Buddei continues. "The author takes pains to apply the discoveries of the later anatomists in the description of the origin, development, structure, position and connection of the teeth in order to give his readers a good conception of the things which he seeks consecutively to lay before them. He rejects with great justice coarse dentifrices which cause more injury to the teeth than good."

This German translator further commends Fauchard, and dentists gener-

ally, for bestowing special care and concern for the patient's comfort in the endeavor to supply useful artificial substitutes for the portions removed or amputated, which is unlike other surgeons, who are perfectly satisfied with the completion and success of their operations, and who make it no concern of theirs to see that the patient is properly equipped with suitable and comfortable artificial substitutes for amputated portions of the body, but leave all this to the care and concern of the patient himself.

PIERRE FAUCHARD.

In the preface to the book itself, written by Fauchard, he observes that it was to be confessed the department of surgery which is concerned with the diseases of the mouth had up to that time been principally neglected, although surgery in the main had arrived to some degree of completeness and important discoveries had been made in anatomy and in manners and methods of operations. There had been a number of learned and curious observations brought to light, and yet *dentists* could not at that time find much assistance in the direction of teaching them how to operate.

"When writers like Urbanus Hemard and B. Martin mention the teeth and their diseases at all, they do not go into details," Fauchard says. "The former wrote a book entitled, 'Researches in the Real Anatomy of the Teeth,' and of the nature and characteristics of the same" and gave some of the diseases to which the teeth are subject; the other, who was an apothecary to his highness, the prince, gave us a dissertation upon the teeth, which was printed by Thierry in Paris, in 1679, in which he described the structure of the teeth, their diseases and remedies with considerable system. Otherwise we do not know of a public nor of a private course in surgery in which the theory of diseases of the teeth is treated circumstantially, which is so necessary for the healing of the diseases which concern them and the parts which surround them."

Thus he was the first writer to suggest the use of broader education for dentists.

"While the most renowned surgeons do not pay any attention to this part of their art, or at least do not cultivate it with any particular interest," Fauchard continued, "It is due to their neglect that people without experience and without theory have assumed, without instruction and without method, to practice it.

"Only a few years ago in Paris our eyes were opened to this misuse. Since



then" (in the year 1700) "an examination has been required of those who have determined to devote themselves to the treatment of these diseases, who have received the title of *experts with the teeth* (*experts pour les dents*), although many of these are less than mediocre in their knowledge.

"To remedy this need it was hoped that a skillful dentist like Mr. Carmeline might impart his manner of operating and his practical experience obtained in a great number of fortunate cases of dental diseases. What this renowned dentist did not do, I now undertake, and I will, at least, try to furnish an example which he, with his greater knowledge and experience, might have done with much better success.

"I give to the world the fruit of my labors and I hope that the same may become useful to those who will follow the profession of a *dentist*, and to such persons as will have a care to keep their mouth in good condition it may be of great advantage."

Fauchard first mentions the nature of the teeth, their growth, their strength, their position and their use, then considers their diseases.

"I mention more than a hundred of these which differ from each other," he writes; "very much in excess of the number heretofore described. I divide the same into three classes. The first contains the diseases whose cause is traced to external things; the second whose cause is hidden, and the third embraces those diseases which are sympathetic and only occur occasionally. In this last class I mention the most peculiar accidents, and lastly I explain with great precision the manner and method of preventing or of healing them.

"The relation between the gums and teeth is such that the diseases of the one may easily extend to the other, and, therefore, I consider the diseases of the gums also. Further I take up the manner of operating. It requires greater knowledge and skill to extract teeth than is imagined by most men. I speak of the care which must be taken to keep the teeth clean, how to file them, how to cleanse them, to burn or cauterize them and to fill them with lead. I treat upon the means to correct their misplacement and to improve their position; to replace them if lost and to fasten loose ones. The loss of the teeth is most unfortunate, but art can replace them. I have made and completed many artificial pieces and have discovered methods to replace the loss of a portion of the teeth or all of them, and these substitutes made artificially have become as completely useful as the natural ones. I impart my knowledge of this in as perfect a description as I am capable of. The diseases of the mouth, or other diseases which thereby are engendered, are at times so persistent and poisonous as to destroy partially or completely the maxillary bones, or

at least the alveoli, so that at time a portion of the saliva or the food does not follow its natural course but is discharged through the nose, or that the mucous which should flow through this channel is discharged into the mouth. Thus the articulation of the voice is interfered with, and breathing is only carried on with difficulty. In order to relieve these difficulties, I have invented five different styles of stoppers of the gums (obturators) or instruments by the help of which the patient again has the use of those parts which he had lost. Of this I give a very extensive description.

"I have thought that it is necessary that I should give an explanation in this treatise of my manner of using the various instruments which are constructed with a view of operating upon the teeth. Of these I have improved some and others I have invented in order that they may be used with greater advantages.

"At the end of the first part of this book I have enumerated seventy-one of the most peculiar diseases which I have treated, together with directions how to proceed in similar cases. In order that nothing should be omitted which might be conducive to the general usefulness of this book, I have had prepared forty copper plates, which represent the teeth in their natural state and also in malformed and malplaced positions; those of excessive sizes; tartar stones, or bone which has been removed from them or other portions of the mouth; the instruments which are necessary for operations; the artificial pieces which serve to substitute a portion of the teeth and the five different obturators which I have already mentioned.

"At last I give in this treatise needed directions belonging to the spirit of this matter; and positions of the portions of the mouth; the positions in which the patient is to be placed during operations, and the appropriate position which the operator must take. Further, I show to the reader that there are people who care very little to learn from the foundation the difficulties which surround the art of a dentist, and who have no taste for reading a manual or a description of the instruments. There are also people who will criticize this work and the things which I mention, which may seem to them either too simple or too well known, but I reply to them in advance that it was my object to write for everybody, and particularly for those who desire to learn the part of surgery which I practice. That I wish to give them that advantage, which they may grasp clearly, and to place in their hands a method which appears to me the clearest and simplest, in order that the public may derive the most satisfaction therefrom. Such as may read this book without the desire of learning how to operate will find in it instruction

upon a thousand matters which will be useful and pleasing to them, without reading the manual and the description of the instruments, which, I confess, to those who are not willing to pursue the profession, would be very uninteresting."

ANATOMY.

Fauchard's anatomical discussion may deserve just a mention. He says the fleshy substance which covers and surrounds the alveolus is called the gums. He writes: "It is a continuation of the membrane or skin, which is known by the name of periosteum, which immediately covers the bones, as also with that which lines the inside of the mouth. The gums, as well as the united bony bands or alveolus, serve to embrace and hold fast the teeth.

"In each tooth we recognize two distinct parts, one is that which is external, which is not included in the alveolus, and this is called the body or corpus of the tooth. Upon its base or foundation there is generally a small circular depression, which is more or less marked, and called the neck or collar of the tooth. This is covered by the gum in part. The second portion lies hidden in the alveolus and is called the root of the tooth. / The four teeth which are in front of each jaw are called incisors, from the Latin word which means cutting, and the protruding ends of these teeth are particularly adapted for the cutting of food. The dog teeth are placed directly behind the incisors and these are two in each jaw. They are called dog, or canine, teeth because of their similarity to the teeth of dogs. The teeth which immediately follow the canines are two small and three large cheek teeth, or molars, placed on each side of the jaws. They are divided into large and small molars, because the first two which appear are not as thick and not supplied with as many elevations upon the ends of their bodies as those that follow after, and because they have fewer roots than those that are behind them. When the two jaws are closed the elevations of the teeth formed by the under jaw fall into the depressions of the teeth formed by the upper jaw and the elevations of the teeth of the upper jaw drop into the depressions of the teeth of the lower jaw. This arrangement enables them to crack and grind the hardest and firmest foods completely, and in this manner they triturate the foods which the action of the incisors and the canines has begun to prepare.

"The body of each tooth has been given the name of crown, but such name appears inadaptable excepting for the body of a molar. These alone have a

similarity to an old crown by reason of their elevations which are upon their ends."

The author further describes the twenty teeth of the deciduous set and insists that these teeth are not without roots, "as some writers have stated."

He observes further:

"The many formations observed in the teeth are so great that it is impossible to describe all kinds and conditions and wonderful forms which nature occasionally gives to them. If in the formation of every portion of the human body the same variety was shown we would very seldom find any one who is not malformed."

Fauchard reports that in 1714, Mr. Laudumiey,¹ who was sent to the Spanish court to operate upon the teeth of his catholic majesty, had shown him a third upper molar which was composed of two teeth which had been joined together by their roots. The crowns of these teeth were separate, but their roots, seven in number, were united and seemed to be mixed up, although they were perfectly distinguishable from one another. In explaining the origin of such teeth Fauchard wrote: "The germs had been mixed and the separating wall of the alveolus was not formed to keep them apart. The roots of the teeth as well as their alveoli are surrounded with a common membrane or periosteum."

Continuing Fauchard states:

"The first teeth, which are called milk teeth, separate themselves from their roots without any one knowing just what becomes of these roots, and from that it has been concluded (by some writers) that they have no roots. In order that the true cause why these teeth fall out may be understood, it will be necessary to know the manner and means by which they separate their bodies from the roots, but as this is a question that up to the present time has not been decided, one must be satisfied when it is stated as has been observed, that they drop out of or separate themselves from their alveolus. When the first tooth resists the pressure of the one that follows, which occasionally occurs, then the second tooth bores its way through the gum, sometimes inwardly, sometimes outwardly, and appears crooked and twisted. If the first tooth is removed or drops out itself, the new tooth will again become straight and take the place which the milk tooth occupied before, but with the molars there is no such relation."

¹ Laudumiey was at the time well known as a dental surgeon of Paris, but not as a writer upon any dental subject. In 1723, he received the appointment of dental surgeon to his majesty, Philip V, king of Spain.

WORMS IN THE TEETH.

"Occasionally worms are found in the caries of the teeth, in the slime or in the tartar, which are called teeth worms. Distinguished writers have mentioned these. I have never seen them, but will admit them as not being impossible, but I mention that these worms do not eat the teeth and make them carious, that they are only present, if at all, because the foods or the badly conditioned saliva may have deposited ova of noxious insects in the caries of the teeth in which they have been mixed with the food remnants, and that these ova, after having been so deposited, have been incubated and the worms may then have made their appearance. Be this as it may, these worms are not the only cause that we have to struggle against under these conditions, and, therefore, it is not necessary if they are present to give them any particular looking after. The populace and some writers have mentioned that all toothache and caries are caused by teeth worms, and that these worms gradually eat up the tissues of the body and nervous fibres. If this were so, it would be easy to give an explanation of the pain which accompanies the caries of the teeth, and much labor would be spared the natural scientist.

"Riverius, a Physician of Montpelier, in his medical work ascribes as a cause for toothache worms which are generated in the caries of the teeth. Audry relates that the worms have been seen under the magnifying glass under a crust or rind, which has been accumulated in the uncleanness of the teeth, and that these worms are exceedingly small, that they have a round head which is marked with a black point, that their body is long and narrow, similar in shape to the worms which are seen by means of the magnifying glass in vinegar. He adds to this that these worms develop an evil odor while they disintegrate the teeth."

Fauchard expresses the opinion that it is an error to imagine that severe toothaches are caused by worms. "I have done what I could to see these with my own eyes," he writes. "I have used the very best magnifying glasses obtainable, and have made many examinations with these of carious or freshly extracted teeth and of tartar matter of differing consistency which surrounded the teeth, but I have never succeeded in seeing these worms. Teeth frequently become carious from internal causes, so that one could hardly have the belief that worms could be the cause of such carious condition because the enamel and the upper surface remains uninjured and without change."

CUPPING THE EARS TO CURE TOOTHACHE.

"There are people who claim to be so skillful and artistic as to remove the most deep seated dental diseases by cupping the ears or burning them with a red hot iron, which operation they call *barrer la veine*, or tying the arteries. I know very well that the renowned Valsalva describes very carefully and particularly the place upon the ear where the hot iron is to be applied when toothache is to be stilled by it. I would like to consider with all respect the views of so distinguished a writer, and will believe that there may be cases in which this measure may be well applied. Nevertheless I cannot persuade myself to believe that the pains of the teeth which commonly befall them can be cured in this way.

"In Nantes I knew a Turk, who was a clockmaker by profession, who had achieved a great reputation for healing toothache in this manner, but I know that without reference to such distinguished cures most of those who had entrusted themselves to his care finally came to me for relief."

Fauchard quotes from Monsieur de Brantome, who says, in speaking of the Princess Elizabeth of France, wife of King Philip II of Spain, "I did not get to her for two days on account of rheumatism of the teeth which I contracted at sea. She, therefore, inquired of the maid where I was and if I was indisposed. When she learned my condition she sent her apothecary to me, who brought to me a very singular herb, which was said to be excellent in my difficulty, which I was to hold in the hollow of my hand and then the malady would at once disappear, which actually occurred."

PATHOLOGY, MATERIA MEDICA AND THERAPEUTICS.

Fauchard says "incipient caries" may be cured in three ways; the first is the application of a mixture of essence of cinnamon and essence of cloves, or either of them alone. The second is the actual cautery, and the third the filling with lead.

"When caries proceeds so far as to cause pain," he says, "it must be removed and in the carious cavity must be placed a little roll of cotton which has been dipped in cinnamon or clove essence. This must be placed in with care so as not to cause too much pressure when the cotton is placed and stuffed in. Four or five days later more of the carious matter can be removed, but after having proceeded with this method, and if the pain still continues, the actual cautery must be resorted to, and sometime afterwards the tooth should be filled with lead, if the caries permits this, as occasionally we meet cavities

which are in such condition that it is impossible to retain the lead within them. When the caries proceeds to the chamber in the tooth it sometimes occurs that an abscess is formed. When I discover that pus is formed, I am satisfied with removing the carious portion, and then I place the end of my sound or explorer into the pulp chamber in order that the parts may be more easily affected. After the pus has flowed the pain ceases, then I allow the patient to wait one or two months, and then fill the tooth with lead."

He admits that certain topical applications may be made which, to some extent, would contribute to the stopping of the toothache by conducting the flow of the circulation and "juices" away from the tooth and into other directions (counter irritation), and then gives a number of prescriptions of plasters for toothache, as follows:

"Take of pyrethrum root, black pepper, ginger, staphisagria, mace, cloves and cinnamon, each, a half ounce; sea salt, an ounce; make all into a fine powder and place it in a glazed earthen vessel; pour over this twelve ounces of good red vinegar. Let this simmer over a low fire and stir the same continuously with a wooden spatula until it becomes of the consistency of thick honey; then take it from the fire and transfer it into a bowl of delft porcelain. Apply a piece of this as large as a small bean, enclosed in a bit of lint, and place this between the gums and cheeks on the side where the pain is."

He describes the operations which may be undertaken upon the teeth as follows:

"They may be cleaned; they may be straightened; they may be made shorter; caries may be removed from them; they may be cauterized; they may be filled with lead; they may be separated; they may be placed in proper position; they may be fastened; they may be removed from the jaw; they may be replaced in the jaw; or they may be taken out to be placed in another person's mouth, and, at last, teeth are artificially constructed and may be placed instead of those that have been lost. All of these operations demand a skillful, steady and trained hand and a complete theory. They require a scientific knowledge in order that one may know the right time at which to undertake an operation, to postpone it or to avoid it. From this we must conclude that a knowledge which is demanded, if one wishes to be a completely equipped *dentist*, is not confined to as narrow a sphere as many imagine, and that it is careless and dangerous to place oneself in the hands of one who has not undertaken to learn even the beginning of the teaching.

"When a patient presents himself I endeavor to place him in an advantageous position in order that a careful examination of his disease may be made.

In order to make the operation easy, it is well to place him in an easy arm chair that is firmly constructed and is clean and comfortable, the back of which is upholstered with hair, or supplied with a soft hair cushion which may be raised or turned according to the shape of the person. When the person has been placed in this chair so that his feet rest upon the ground, his body against the back and his arms upon the arms of the easy chair, his head should be placed firmly against the back of the chair, but the head should be changed according to the necessity.

"The head must be placed in such position as shall give to the person the least inconvenience, but it should at the same time be in the most comfortable position for the operator. It is not sufficient when one wishes to operate that he consider only the condition of the patient, but there must be added to this the position of the dentist, his varied attitudes, the motion of his arms and his fingers. He has to be first on the right and then on the left side, seldom behind the person. He should seldom occupy a position in front of the patient, as in that way he stands in his own light which is so necessary to him."

He further describes cases in which the easy chair is not suitable and instead of this he uses a couch or sofa, or a rug or low bench such as the Turks employed.

"It causes me to wonder that those who devote themselves to teeth drawing commonly have their patients sit down upon the floor, as that seems bad and unskillful," Fauchard writes. "Aside from this, the position is tiresome and creates fear, especially in pregnant women it is highly injurious. What astonishes me more than all is that even now certain writers recommend this position as the most preferable, although it should be absolutely discarded."

To aid in the eruption of the deciduous teeth Fauchard recommends "the application of the marrow or brain of a rabbit, the foot of an old rooster, or his comb, that has been freshly cut off and is still bleeding, to be rubbed upon the gums."

He says: "These latter remedies have been praised by many distinguished practitioners. An extract of the *gramen caninum* (dog grass) is to be preferred." He says also: "One may take cleansed barley, prunes, figs, to be boiled together, to which decoction is to be added a small quantity of rock candy. In this is to be dipped a soft linen rag and with this the gums are to be frequently moistened."

"In difficult dentition he advises that "the general remedies which the physician should order should not be neglected, such as bleeding, clysters to keep the bowels open, which reduces the fever and stops or prevents con-

vulsions." When all of these remedies fail, he says "there is not the least danger to be feared in using a sharp knife and cutting through the gums until the tooth is reached, and this incision should be made in the shape of a cross."

Fauchard gives the following description of an operation on the jaw of a woman :

"In 1711 a poor woman, fifty-five years of age, affected with scurvy, went to the hospital and remained there a month under treatment. She was dismissed without being completely healed. This induced her to call upon me some time later. I made a careful examination of her mouth and discovered two very conspicuous fistulous openings which proceeded from the interior of the mouth to a place below the chin. I discovered that a large portion of the jaw bone was carious. This led me to remove several of her molars which were loose. I also removed three pieces of exfoliated bone, of which the larger portion was an inch and a half in length and an inch in width. I also removed all putrified flesh and applied a dressing of dried peruvian balsam, which was twice a day injected into the fistulous opening. After twenty-eight days she was dismissed thoroughly cured."

He comments upon this case by saying that he "never could have served this poor woman properly or diminished her suffering without devoting his full energy and attention to her case."

After devoting several hundred pages to the relation and description in individual cases of abscesses, and commenting thereon, he concludes the first part of his book with this observation :

"It is not sufficient that this treatise has taught how the teeth originated ; how they grew ; how they are succeeded by new ones ; what their strength is ; from what causes they suffer and are destroyed ; which is of the most service to preserve them and in how many ways, by means of art, their malformations may be corrected, and broken down ones healed. I must also mention certain conditions which affect diagnosis and prognosis, which may be made by a careful examination of the teeth and which may reveal that many diseases to which the human body is liable may be better understood.

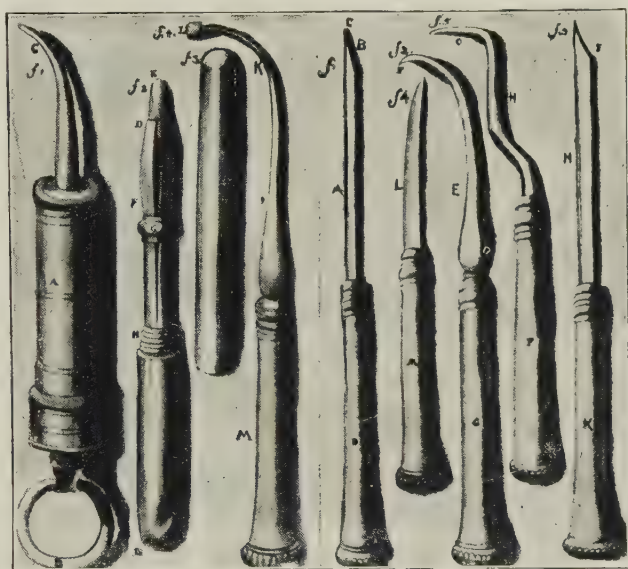
"When Hippocrates, Galenus, Avicenna, Aetius, Riverius, Lommius Gordonius and other distinguished writers mention the indications of certain febrile diseases, they carefully observe not only the signs which are externally visible in the eyes, the temple, the ears, the nose, the tongue and the lips, but they also look to the signs which different colors of the teeth expose to view. Frequently in such cases the color of the teeth indicated the extent of the

illness, and at times it gave the indication that death was at hand. People who retain their teeth the longest are generally the healthiest, the strongest, the least liable to be sick and live the longest.

"Some writers have mentioned that a careful examination of one's teeth will reveal signs from which coming events can be foretold so that one's future may be revealed to him. It is somewhat astonishing that otherwise sane writers should be led into errors whose incorrectness experience has clearly exposed."

OPERATIVE AND PROSTHETIC DENTISTRY.

The second part of the book is devoted to operations upon the teeth and to



Scaling Instrument.

Fig. 2. Mouth Syringe.

Fig. 2. Holder for caustic.

Fig. 3. Caustic stick.

Fig. 4. Cauterizing Iron.

Fig. 1. Ass's Snout.

Fig. 2. Parrot's Beak.

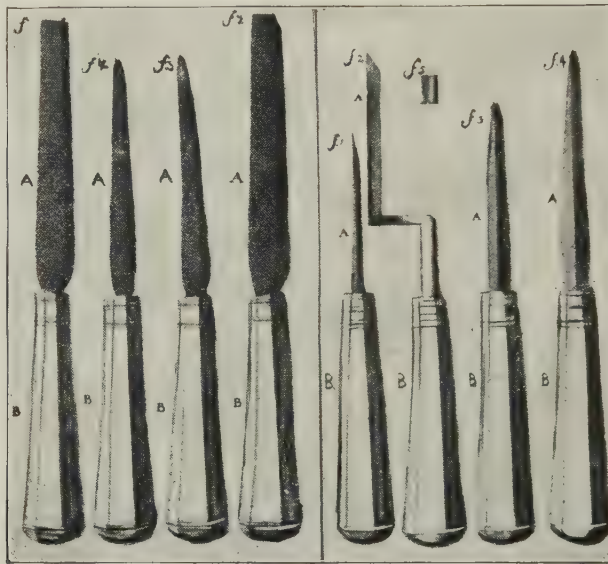
Fig. 3. 3-Cornered Chisel.

Fig. 4. Knife.

Fig. 5. Z shaped Hook.

prosthesis. He very minutely describes the position of the patient and the position of the operator in cases of cleaning the teeth from tartar, giving different positions for the right or the left side, and for operations on the

teeth for the upper or lower jaw. The detail of his technic is exceedingly remarkable, the position of thumb and fingers of the operator is described and the grasp of the instruments. He gives a complete description of the use of the file and mentions files especially adapted for this purpose, and speaks of files that are cut only on one side so as to avoid injuring the tooth opposite to the one to be operated upon. He describes and illustrates eight varieties of files.



Files.

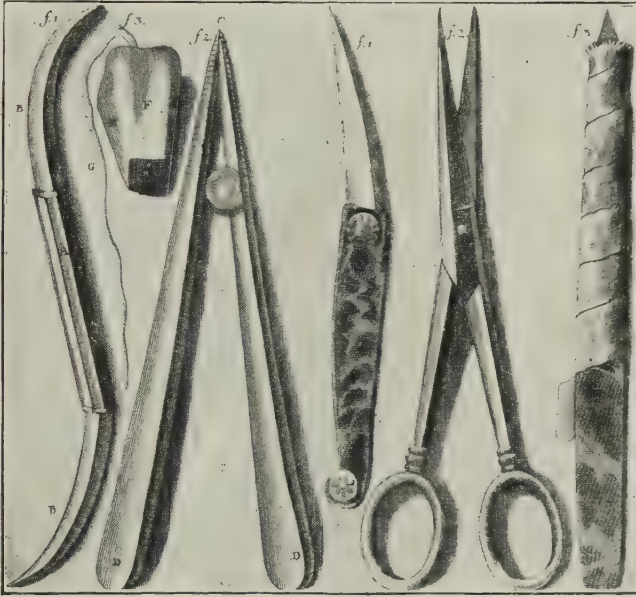
He continues: "Of all the instruments which are used in the mouth, those which are used for filling the teeth with lead have to be made the strongest, as great force is applied in all directions when the lead is introduced and condensed. It is, therefore, necessary that these instruments should be particularly well seated in their handles and be supplied with strong ferrules."

He also suggests that in cases where the fillings are placed in an occlusal surface, that is in apposition with the opposing teeth, that the force of mastication will assist in the condensation of the lead, or "that the patient may bite upon the instrument and thus assist in condensing."

GOLD FOR FILLING TEETH.

With reference to gold as a filling material Fauchard says:

"There are some who believe that it is better to use the beaten gold for the filling of carious cavities in the teeth than lead or tin. I would raise no serious objection to the use of gold, if fine lead or tin in these cases

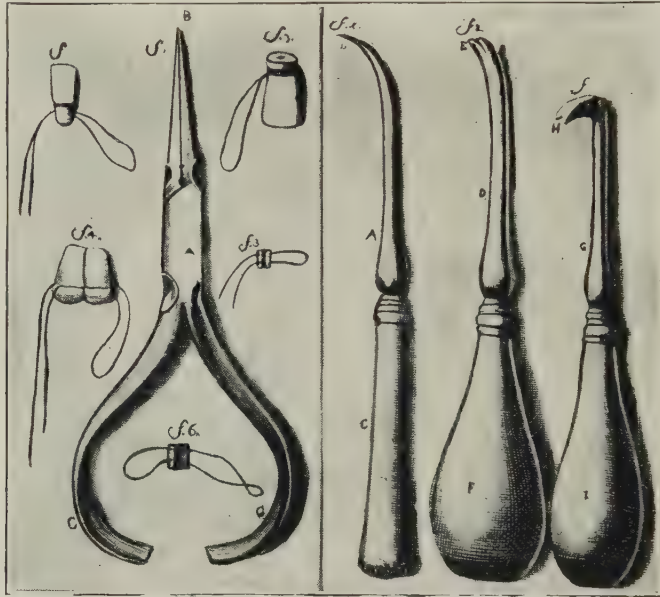


Instruments for opening closed
jaws.

Bistouri, shears and tape-
wound lancet.

had not the same virtue as gold, and on that account I leave such as are willing to stand the cost of gold to choose which they prefer. A fine tin is preferable to lead because lead becomes blacker and does not last so long. Both of these, however, are to be preferred to gold, as they adapt themselves better to the inequalities which exist in the cavities of carious teeth, so that such teeth are in less danger to be further destroyed. Aside from this, gold is dear and not every one is inclined or in a position to stand the cost. Irrespective of this, there have been found those who have maintained that gold has great virtue, and there have also been found persons who have served such persons according to their pleasure. But to tell the truth,

these have themselves paid dearly for what cost them little or nothing, inasmuch as the gold they employed was nothing else but leaves of tin or lead which they have stained yellow, to look like gold, with a tincture of saffron or 'gummi gutte,' over which alcohol or brandy has been poured and which has been placed on warm ashes. As that cheat could not be long concealed



Instrument used and Method.
of tying-in loose teeth with
Gold Wire.

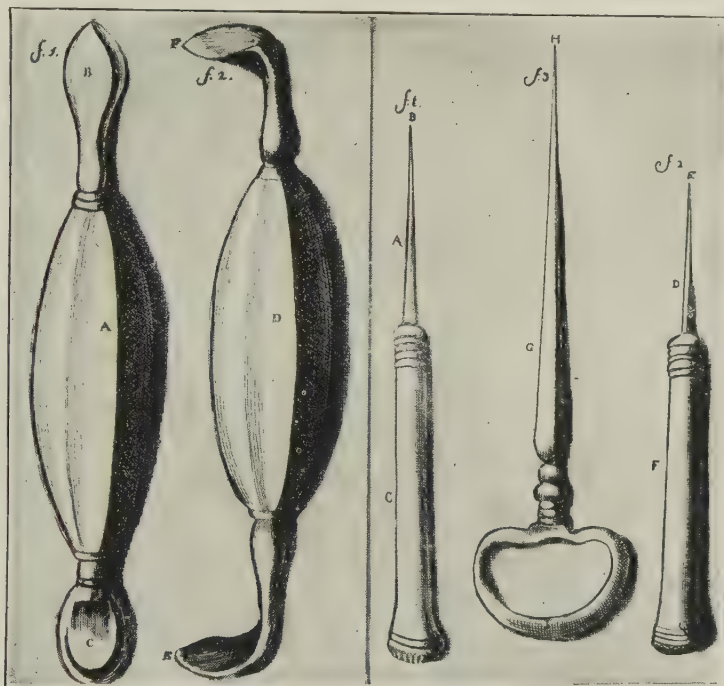
Elevators used for Extraction.

they have used tin or lead, upon each leaf of which had been applied a leaf of gold, and they have then called this an all gold filling."

In using lead he describes three thicknesses, "one as thick as paper, the other a little thinner and the third a little thinner still." This is to be cut in "small strips, longer or shorter, broader or narrower, according to the size of the cavity, and it is to be preferred that a filling might be constructed by the use of only one strip if possible, as a filling composed of several strips would not remain in position as firmly or as long." He gives a detailed account of the position of a patient and operator and of the instrumentation. And he remarks that if the tooth is sensitive "the lead must be placed in gently, and it may be sufficient to so introduce it that it will remain, and in a

day or two afterwards it may be stamped or pressed in firmer, if the pain does not recur, and in this way the sensitive portions of the tooth will become accustomed to the pressure of the lead."

Referring to caries of the "lower surface" of the upper incisors or canine teeth, he says:



Scraper and Gravers for ivory working.

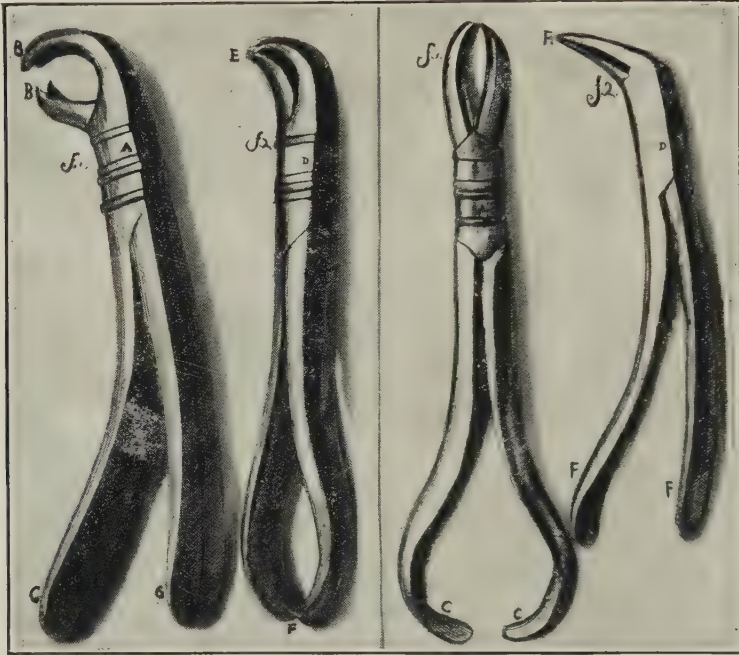
Figs. 1 and 2. Drills for enlarging root canal.

Fig. 3. Awl for making pivot canal in lead bushing.

"The operator should be at the right side, one of his knees placed on the ground. The upper lip will be held with the index finger of the left hand, the thumb of the same hand resting upon those teeth which are located to the right of the tooth to be filled with lead. In this position the lead is introduced. If this position is not comfortable by the time the filling is nearly completed, the operator may rise, place the left arm over the head of the patient and then complete the filling of the tooth.

"When one desires to fill the lower surfaces or ends of the bodies of the molars on either side of the upper jaw, the position of the operator should be at the right, or in front of the patient, and with one knee on the ground.

"When the extreme ends of the crowns of the teeth of the left side of the upper jaw are to be filled with lead, one knee is placed upon the ground;



Instruments used for Extractions.

the thumb of the left hand rests upon the incisors; with the index finger of the same hand the upper lip is held away and so the lead is introduced with the piugger, which is held in the right hand. Then one rises, places the left arm over the head of the patient and raises the upper lip with the index finger of the left hand. With the great finger of the same hand the under lip is pressed down and prevents the closing of the lips. This same position is also suitable when the inner and upper surfaces of the teeth are to be filled."

In giving the technic of the application of the actual cautery he observes:

"When it is necessary to cauterize the tops of the crowns of the molars of

the right side of the lower jaw, or the exterior surfaces of the same, the same position is taken as previously told. The closing of the lips is prevented, but previously a small piece of tin (tinned iron) is placed between the cheek and the tooth that is to be cauterized. This precaution is used, as otherwise it is

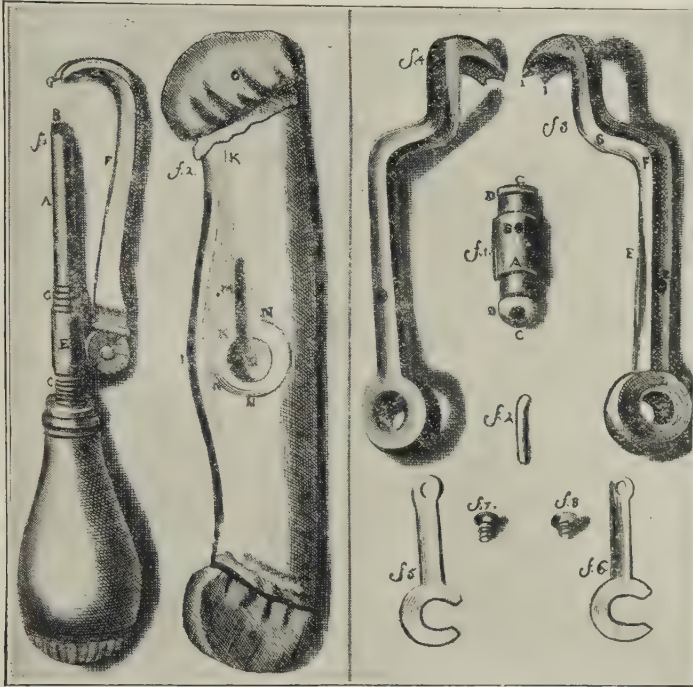


Fig. 1. Elevator.

Fig. 2. Showing body of Pelican
with the arms removed.Dismounted parts belonging to
improved Pelican.

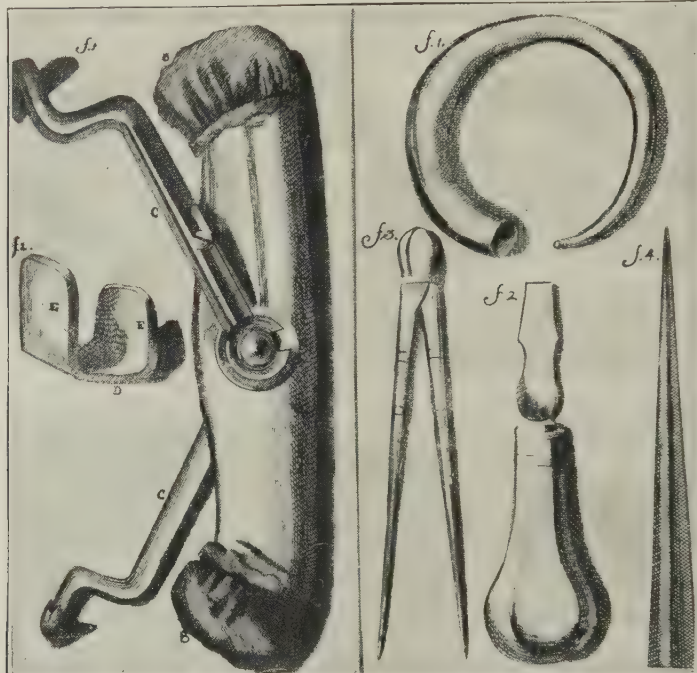
to be feared the flesh might be burned. This plate may be made concave or hollow on the inside, and convex on the outside. It may be made of tin or silver in the manner of a spoon."

ORTHODONTIA.

Fauchard next proceeds to consider the straightening of crooked or irregular teeth. As a means for accomplishing this he uses pressure of the fingers, common or silk thread waxed, little plates of gold or silver, or any other

suitable material, and at last a pelican, or straight forceps, and if these means do not accomplish the object, the thing to do is to extract the offending tooth.

"Teeth of young persons are much easier to straighten than those of grown up persons," he stated, "because in young persons the roots are not



Double Pelican, used on the right side of the lower jaw and the left side of the upper jaw.

Prosthetic Tools.

Fig. 1. Curved rat tail file.

Fig. 2. Screw Driver.

Fig. 3. Dividers.

Fig. 4. Triangular File.

as large, and partly because the parts surrounding them are softer. When persons of some years undertake this operation the use of considerable time is required before success can be attained."

On account of this slowness, which sometimes covers months, Fauchard was at times led to resort to a quicker and less difficult method, namely the use of the pelican and straight forceps, by which he could in a moment accomplish that which the waxed thread and plates might fail to do after an

expenditure of great time. The pelican is an instrument after the order of the turnkey and constructed on the hook and lever principle. After teeth had been placed in the desired position by means of this rapid process he used a lotion composed of "aqua rosarum and aqua plantaginas, of each two ounces; white wine, four ounces, or alcohol one ounce; honey, one ounce. This is mixed together and used five or six times daily for two weeks."

He devotes several pages to the tying in of loose teeth and describes the technic of placing gold wire for this purpose. Sometimes he used strips of gold bands which were supplied with holes through which gold wire was passed, and these were tied and anchored upon firm teeth. In the description of the instruments employed for the extraction of teeth and the operation itself, he mentions the lancet, a push arm, tongs or forceps, an elevator and the pelican.

REPLANTING AND TRANSPLANTING.

The author devotes considerable space to replanting and transplanting of teeth, and remarks:

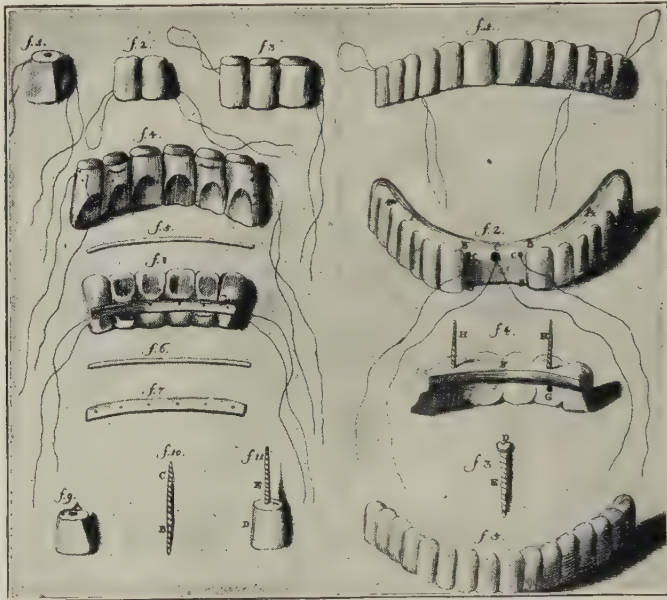
"It is not at all fabulous to speak of a successful transplanting of a tooth from one mouth into another. Not only the old writers, among which was Ambrose Paré and many others, mention it, but we see it in our daily experience that teeth transferred from the jaw of one person to that of another grow fast and remain firm and without change, and fully perform all the requirements. It is even claimed that teeth of this kind have resisted the powerful action of mercury after salivation better than their near neighbors, which are perfectly natural in their positions.

"This operation has so frequently been successful that I am surprised that some practitioners should pronounce it as impossible. The teeth which are suitable for replanting or transplanting are the incisors, the canines and the little molars (bi-cuspids), because these contribute the most to the embellishment of the mouth, and it is to be remarked that when this operation is to be successful the person must be of good health; that the jaw and the gums in which a tooth is to be implanted must not have been subjected to too severe injury, and that the tooth and the alveolus which is to embrace it are to be in due proportion to each other."

HEMORRHAGES AND STYPTICS.

Fauchard treats of hemorrhages following extraction of the teeth and recognizes the following as a styptic: "Sulphate of copper (vitriol), one

pound; alcohol, one measure; place the vitriol in a large melting or earthen pot; place over it a pottery cover, and then place fire all around the vessel and cover the top with glowing coals. Continue this fire for five or six hours in order that the (phlegma) water of the vitriol may be expelled, and it will become as red as blood. Then remove it from the fire and cool it, and then reduce it to a powder. This powder is placed in a large vial and upon this is poured the alcohol which is not to be more than to half fill the vial, so

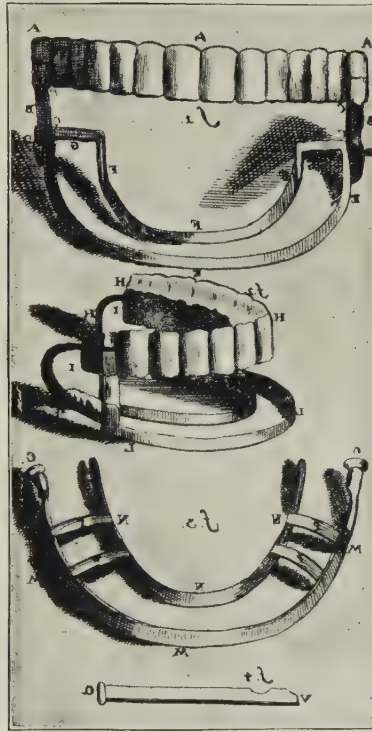


Artificial Teeth and Manner of Fastening Them.

that the powder may ferment. When this vial is well stoppered, it is placed upon warm ashes and kept there for twenty-four hours, the ashes having been put for this purpose in a large pan in which has been placed as much fire as to create a temperate warmth. This vial is occasionally shaken. It is then removed and placed so that its contents can settle and the clear water is poured off into bottles which are then preserved. This liquid is to be used by dipping pieces of lint in it which are placed into the cavity or hollow from which the blood is flowing, and then a pledget of lint is placed over it. This can be held for a quarter of an hour with pressure of the index finger and thumb upon both sides of the gums."

ARTIFICIAL TEETH.

Fauchard takes up the subject of artificial substitutes, in which he enumerates "human teeth, the teeth of the walrus, hippopotamus and the oxen, also the bones of the oxen, horses' and mules' teeth, the teeth of the rhinoceros and the heart of the oldest and whitest ivory." Human teeth and those of the

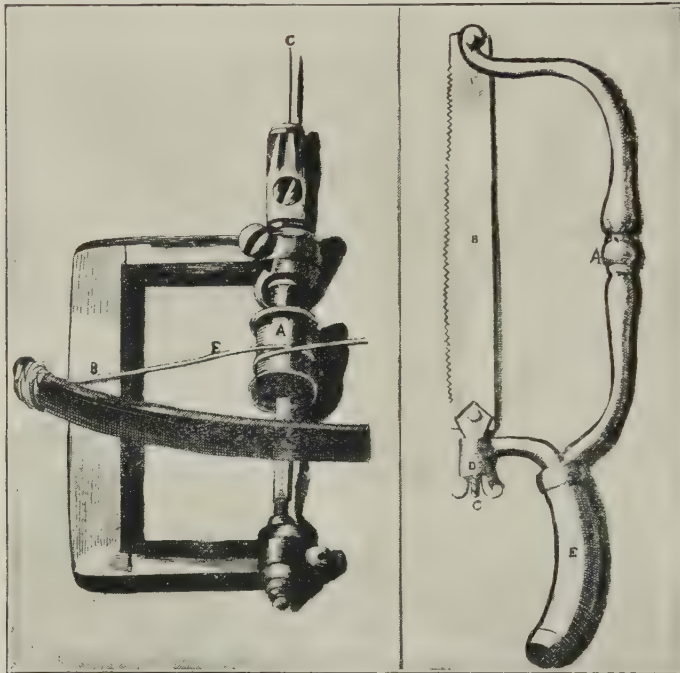


Front and side view of a "machine" or full set of teeth, united by means of a spring.

walrus are preferred by him, "because they are covered by enamel and therefore last longer and hold their color better than all other materials."

He describes the construction of artificial teeth upon remaining roots and their preparation pivot teeth. He filled the root canal with lead and prepared the foundation for the artificial tooth which was to be placed upon this root; then he introduced an awl and formed a hole in the lead that had been

placed in the canal, being careful not to puncture the end of the root, and by means of a pivot, which protruded from the artificial crown, connected this by inserting it in the hole made into the lead that had been placed in the root. He speaks of using pivots made of gold or silver, having them as long and as

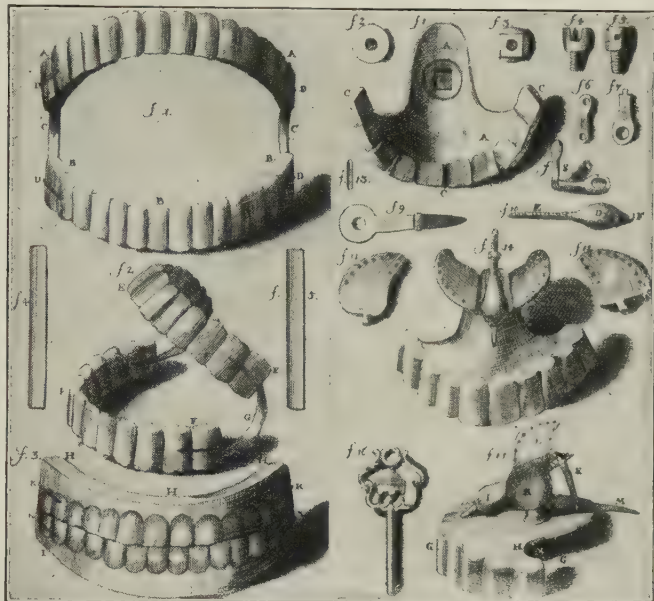


Bow Drill.

Saw employed for Cutting
Ivory or Hippopotamus
Tusks.

large as the canal and the root permit. Before this pivot was finally inserted it was covered with a finely ground cement or putty, and then placed in position after "the end has been warmed in the flame of a candle." The cement or putty which he used for this purpose was prepared as follows: "Sealing wax, two ounces; Venetian turpentine, one-half ounce; finely pulverized white coral, two ounces; melt the sealing wax in a glazed earthen vessel over a slow fire. When it is melted pour in the turpentine, stir and add the powder of corals to it. When the mixture is completed it may be cut into small sticks, which, when they are to be used, should be again powdered."

He says that teeth or artificial pieces which are fastened by pivots or gold wires remain in place for fifteen or twenty years without becoming displaced, while pieces fastened by means of waxed linen or silk threads, which are usually employed to fasten them, last only a short time.



Complete Dentures with Band
Springs.

Obturators and parts used in
construction.

The author describes "an artificial substitute for the upper and the under jaw with teeth, in which there was not a single tooth or root upon which to fasten it." These pieces were carved out of solid blocks of bone or ivory, fastened upon frames of gold or silver and connected by means of strings, or riveted by their ends. Upper and lower plates were carved entirely out of solid blocks. The construction and technic are described in detail. When one looks at the cumbersomeness of these substitutes, one is not surprised that the author and inventor speaks of it as a "machine." He remarks:

"Up to this time artists who devoted themselves to the construction of instruments and dentists had not been able to construct a machine that was

capable of being used, at the same time was so comfortable. This machine has not only the good qualities of anything that has heretofore existed, but it is much more comfortable."

ENAMELING ARTIFICIAL TEETH.

The author continues:

"It seems impossible, and it is at least very difficult, in the construction of artificial jaws and teeth from the materials mentioned, to make a piece that shall be covered entirely with enamel and whose color shall correspond with the natural color of the teeth. Therefore, I have thought that I might be able to find an artificial enamel which could be used to imitate the most beautiful and best enamel of the teeth, and also to preserve the natural color of the gums which have been altogether or in part replaced. To this end I went to the most skillful enamel makers and consulted them with reference to a matter, that so far as I know, no one had undertaken before—to imitate with enamel the color of teeth and of the gums.

"Natural eyes had been artificially imitated and artificial eyes of enamel had been made, but no one had thought to apply this enamel in the construction of artificial teeth, notwithstanding that artificial plates of teeth have a great advantage over artificial eyes. They add as much to the beauty as do these, and aside from this they help to remove a deficiency of a part of the body whose ugliness shocks any one who looks at it."

This process of enameling adopted by Fauchard was probably the fore-runner of indestructible and porcelain teeth.

He describes a method in vogue of fastening artificial pieces. This consisted of boring holes through the artificial pieces and through the gums and fastening them in such a manner that the artificial dentures were supported "similarly to ear ornaments, by holes pierced through the lower lobes of the ear, which gave them no firmness or security in the mouth." He tells of a case of an old woman who had a plate inserted on that principle who was a great sufferer from the same, but who, "fortunately, in a paroxysm of coughing, was relieved of the further annoyance of this attachment because it flew into the fire, from which it could not be removed until half consumed."

OBTURATORS.

Fauchard devotes a large space to the description of obturators and particularly describes a "machine" which combined artificial teeth with an arti-

ficial palate or obturator, the entire piece being carved out of ivory. His various machines of this kind are described in very extensive detail, as is also their construction. Some of the tools and instruments used are reproduced in connection with this chapter.

GARENGEOT—FAUCHARD'S CRITICISM.

Near the end of the second part of this book Fauchard says that "it was practically ready for publication in 1723, but owing to the demands of a busy practice he has been delayed from letting it see the light of day until now," and he refers to a surgical treatise published about that time by GARENGEOT, entitled "New Treatise Upon Surgical Instruments" (which was translated into German by I. A. Mischel under the title, "Treatise of Most Needful and Useful Instruments of Surgery," and published in Berlin in 1729).

Fauchard says he read this book, being particularly attracted by the chapter on the teeth, and says: "The experience of many years and the time that I have devoted to this part of surgery, have induced me to controvert the positions taken by this author and given me the authority to undertake this." Garengéot states that "the tartar does to the teeth what rust does to iron—destroys their outer surface, and makes the teeth loose." He recommends that when teeth are covered by tartar that it must be removed. In order to do so it should be first split with a chisel, which exposes a beautiful white tooth. He observes that tartar separates very easily after it has been split and likens the relations of tartar to teeth to that of "peach and its kernel." Fauchard contends that tartar does not enter into the surface of the enamel and that it may be removed without injury. "But it does not come off as easily as the peach from the kernel," he says, "but, on the contrary, particles frequently adhere so persistently to the surface of the tooth that they can only be removed with a great deal of persistency and sometimes in very small particles."

Fauchard proceeds further, saying that several kinds of teeth-rasps or picks recommended by Garengéot are neither suitable nor sufficient, and that it is not possible, as claimed by that author, that this entire operation can be performed by one instrument, no matter how perfect that may be, and "the chisel, of all instruments, is the least adapted for this purpose."

Garengéot further says:

"Young surgeons know, if they intend to undertake this kind of operation, that they ought not to do like most of the *tooth breakers*. These, in

order to make the tooth nice and white, do not spare the enamel and they rasp a good portion of it away. But this is a great mistake, and the people who entrust themselves to their hands discover very soon, to their injury, that within a short time their teeth are defective and create unbearable pain."

This is Fauchard's comment:

"Never since I have devoted myself exclusively to the diseases of the teeth have I known of dentists, whom this author calls tooth breakers, (*arracheurs de dents*) to rasp away or remove enamel with the instruments used for cleaning the teeth. There is no instrument with such sharp cutting edge that is not dulled by the hardness of the enamel, as this is nearly as hard as diamonds. Of all the instruments, I know none, excepting the file, that would be capable of removing part of the enamel, and this is not an instrument that is used for this purpose, but even that would soon become blunt were it employed for that purpose. There is, therefore, no danger to be anticipated from instruments designed for cleaning the teeth, but much is to be feared from the action of the remedies recommended by this author in the book mentioned, namely, powdered porcelain and pumice, as these are of an injurious character and their friction is dangerous to the teeth. The other ingredients which he mixes with the porcelain and the pumice are not sufficient to counteract the evil effect of these."

Garengeot proceeds:

"When surgeons desire to have files made, they ought not to go to the knife smith. Files that are placed at the extreme ends of certain instruments are of no use and do not take hold. One must have at least a dozen, and the best are obtained from the needlers."

Fauchard continues:

"I do not know whether the surgeons, and especially the dentists and the knife forgers, will agree with this author, but I do know for certain that the files which are obtained from the needlers do not possess the required quality indicated for use upon the teeth, as they are mostly only made for use upon metal or things of that kind, which do not possess the hardness, or anything like the hardness, of the enamel of the teeth. The files are incomparably better that come from the hand of a skilled file cutter, who has been instructed to make them according to the right size and of good steel, and to make them so as not to cut too sharply or too softly, and to harden them properly."

How blessed is the dentist of the present day who can purchase everything he needs and has at his beck and call an army of faithful manufac-

turers, who constantly attend his every step of progress and quickly supply, in most approved form, and even assist in the creation of anything that new discovery, experiment or invention may require in shops and factories exclusively designed and conducted for the purveying of his needs.

Garengot continues:

"If the tooth must be filed, nothing else can result from the force necessary to be exerted upon the file than that the tooth must be very much shaken, and hence a tooth that has been so disturbed from extensive and oft repeated shaking must become loose, and does not grow firm again in its socket, and, in consequence, in time drops out.

To this Fauchard replies:

"If the teeth were as secure against all accidents as they are from injuries or shock resulting from the use of the file, they would last through the entire life. The small shaking which the teeth sustain by reason of the file does not prevent them from growing firm again, as the elasticity of the alveolus and of the gums in a healthy and natural condition has strength to restore the teeth to their firmness. The daily operation of filing has taught us this, and this experience is still more confirmed by the fact that extracted and replaced teeth used in another mouth grow absolutely firm again."

Garengot continues:

"I have seen many women of the better classes for whom the teeth have been made even, in this way (by the use of the file), but who wished three or four years later that they had never had their teeth touched, since they have become carious at their upper margin where the gums are attached to them."

Fauchard says:

"I cannot comprehend how a tooth became carious at the places mentioned because it has been filed at its other surface. I concede, however, that when the operation of filing is done without consideration and discrimination the accidents he fears might occur, as, for instance, when the teeth are filed so extensively that the internal cavity is exposed, but this can only occur with operators who are inexperienced in the art."

The author continues:

"Although an instrument may be dangerous, a skillful person who handles it and knows its use may not have an evil result." Fauchard agrees with this statement, but adds to it the following: "The file is one of the most necessary instruments for the preservation of the teeth. When the teeth

have been separated, or made shorter, by means of the file, they are made stronger, and very often the further progress of caries is interrupted by it." The other continues further:

"When the enamel of the teeth has been entirely filed away or has been made very much thinner, it exposes the spongy portion of the bone, which is the interior of the tooth." Fauchard replies: "That spongy bone, which he names as the interior of the tooth, is a thing which those who have studied the teeth and dissected them to their smallest parts have never yet discovered."

Fauchard proceeds in his criticism by saying: "The method of filling the teeth with lead, which this author mentions, is certainly very easy to accomplish, but it is not to be thought of if the operation is to be a success." He continues: "The author prefers stannous chloride (*oleum stanni*) and nitric acid (*spiritus nitri*), to oil of cloves and oil of cinnamon; but these are corrosive and etching in their action when they enter the sensitive portions like the nerves which supply the teeth, and may cause unendurable pain and even convulsions and delirium; and with these corrosives in the fluid form it is necessary to use a great deal of caution, as they will flow more or less upon the gums, which they so irritate as to create swelling and sores."

It is not deemed proper to continue further in the pursuit of this controversial difference between these early authors. One cannot help noticing the peculiar style and positiveness which German and French authors assumed in mentioning their positions. The frequent reference to the personal pronoun in the first person would lay them very liable, judging from our present viewpoint, to the accusation of being extensively conceited and possessed with almost inexcusable professional vanity, self esteem and assertiveness. But in judging of this we must remember the times, primitive conditions and the small progress of professional and scientific advancement that had been made at that time. One must remember also that authorship in those days was an exceedingly rare vocation or accomplishment.

TESTIMONIALS TO FAUCHARD.

Before dismissing this subject a number of testimonials written and printed in the back part of Fauchard's book endorsing the same and praising the author strike one at the present day as somewhat peculiar, but as they depict the condition of professional literary progress, the customs of the day and somewhat of the status of dental and medical men at that time, a few of these endorsements are here reproduced:

Testimony of Mr. Landumiey, royal dentist to His Catholic Majesty Philip V, king of Spain:

I take too great an interest in the matters that inure to the common weal of all, that I should not attest that I have never seen a book which is more complete, so far as the teeth are concerned, than that of Mr. Fauchard. I find in the same many wise suggestions and discoveries in our art; the title, "The Dentist," which this book has inscribed upon it, and the happy genius his great zeal and constant labors impressed upon it, give much satisfaction to the members of a great art and science. My own experience, secured in the same way as that of the author, leads me to express, with all due praise, my pleasure obtained from reading this excellent book which this writer has composed, and which he, with all disinterestedness, and praise-worthy and very rare example, has made public and given to the view of all.

The opinion of Dr. Hecquet, regent of the Medical Faculty in Paris and former dean of the faculty:

This book is no work that has originated in the imagination, nor is it a question of means and operation, or of medicines which may be experimented with in the treatment of the diseases of the teeth, but it is a sure and certain way, which Mr. Fauchard has discovered by his labors and experience. This he now gives, with a great deal of sincerity, with sensible reflection and with great deliberation, publicly to the world, for which work he is entitled to the high esteem and assured confidence by right.

Dr. Silva, regent of the Medical Faculty of Paris, body physician to the duke and consulting court physician to the king, says:

The book of Mr. Fauchard is based upon a great many experiences which have been carefully noted, and from which wise and useful deductions have been made. It is worthy of praise that the author has undertaken to produce a more accurate work than all those which heretofore have come to light. The world owes him thanks for this gift, and it could not have received it from any one else who could have availed himself more usefully of his experience.

Testimony of Dr. Duplessis, city surgeon of Paris:

Although the diseases of the teeth occur frequently, and there are many of them, yet there has no one been found for a long time who has been able to give lessons and rules, based upon his own observations, of such diseases and how to relieve them, but Dr. Fauchard does this beautifully in his so-called "Dentist." In this book one finds such sensible treatises, such well considered conclusions and such certain means, that one would act unjustly if one did not express his great satisfaction that so useful and so necessary a work, which heretofore was missing, has been supplied to the surgeon.

There was no journalism at that period worth mentioning, and certainly no medical, surgical or dental journalism, hence there was no opportunity for press notices or criticisms of publications, and Fauchard certainly showed a very practical turn of mind when he published the commendations of his work as an appendix to the work itself.

Dupont early in the seventeenth century, employed replantation as a cura-

tive method in severe odontalgia. He advised the extraction of the afflicted tooth and its immediate replacement, and claimed originality for this practice.

BOURDET, a French dentist, in the middle of the eighteenth century indignantly and contemptuously refers to a charlatan of his period who implanted teeth in the holes made for this purpose in the jaws. Bourdet could not then foresee that this very operation, daringly undertaken by an American dentist in the last years of the nineteenth century, should give to him a great reputation as a skillful discoverer.

In 1746, MOUTON first described gold crowns, constructed for the preservation of much decayed teeth, and he enameled these crowns, when constructed as substitutes for the front teeth, so that they should more closely resemble the natural teeth. He is also given credit for having been the first to introduce artificial teeth held in place by means of clasps instead of ligations, which had previously been the means of retaining partial artificial substitutes.

Philip Pfaff, who was the dentist to Frederick the Great of Prussia, in 1776, described the use of wax as a material to take impressions in, from which he obtained plaster models. He has been credited with being the first to have attempted the operation of capping exposed pulps, and he made artificial teeth out of mother of pearl.

CONDITIONS IN ENGLAND.

As in France, so in England, the barber-surgeon was the earlier representative of the dental practitioner. He was generally closely identified with the medical profession. The "Company of Barber Surgeons" in England was incorporated by Edward IV, in 1461. A law forbidding the practice of surgery by any one who had not passed a previous examination was enacted, in 1511, by Parliament. The title of the organization was changed to "The Company of Barbers and Surgeons," and the only surgical operations permitted to the barbers was that of extracting teeth. In 1516 a preamble of an act of parliament declared that the trade of the barber was independent and foreign to the practice of surgery, and in 1745 the barbers and surgeons were entirely divorced. The surgeons organized and were known as the "Surgeon Company," and in the year 1800 this gave place to the "Royal College of Surgeons of London." The several "Royal Colleges of Physicians and Surgeons" in England, Scotland and Ireland constitute the medical profession of the British Isles today. What became of the

barbers after their divorce is not so clear; some of them, no doubt, continued to extract teeth, to clean them and occasionally to replace a lost tooth.

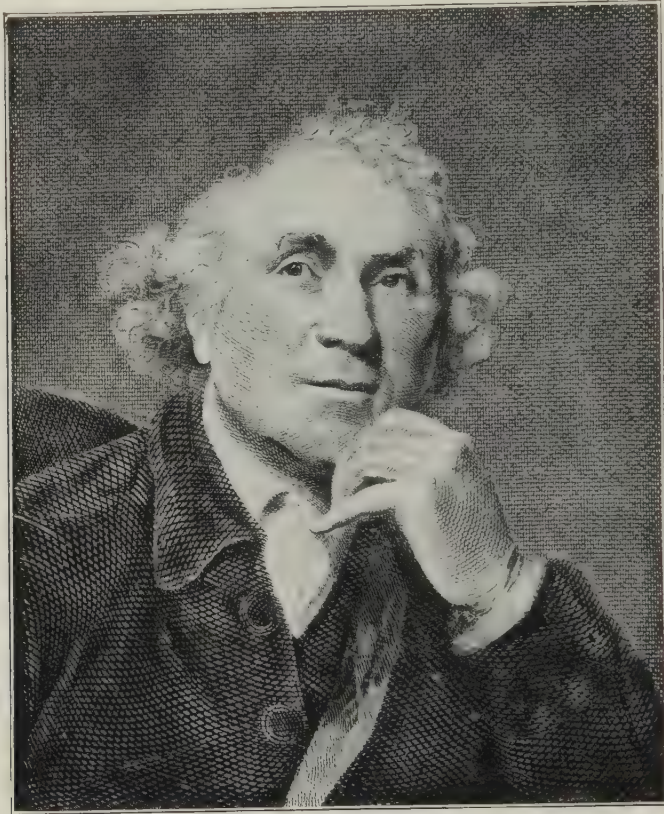
Their calling being especially devoted to the beautifying of their fellow men, what could be more natural for them than to continue rendering such services as are conducive to the preservation of the teeth? But, as has been shown in all history, the progressive minds and leaders in development of dental science and art, with only rare exceptions, were men who had broadened their knowledge in the study of the underlying sciences.

JOHN HUNTER.

The great development in dental art and science in England undoubtedly had its origin with John Hunter, who was born in Scotland, in 1728, and became a student of his brother, Dr. William Hunter, who had at that time a very distinguished reputation as an anatomist. John Hunter's early predilections toward mechanics, and his manual dexterity, had led his parents to place him with a cabinet maker in Glasgow to learn that trade, but owing to the failure of his master he was obliged to return home. Having taken pride and satisfaction in his brother's distinguished career, he applied to him to become an assistant, and, accordingly, went to London and joined his brother, who immediately put him to work on a dissection of the arm. It is said that John Hunter became the best practical anatomist of the age while continuing in attendance upon his brother's labors and being a pupil of St. Bartholomew's and St. George's hospitals. He was also admitted to Chelsea hospital to the lectures of Cheselden.

Dr. Hunter had a superb anatomical collection and an extensive library. To him students came from all countries and scientific men sought his acquaintance. This afforded John Hunter great advantages in the knowledge of the most advanced physiology and pathology, and revealed to his mind the direction in which original research was most desirable. It is said he never became very fluent in his delivery, or clear in his expression as a lecturer, and that lecturing was a painful task to him. In his lectures he usually stated that it was his purpose to give only the results of his own operations and experience, because the opinions of others might be found in their works, and that he hoped to give such useful observations as to put the art in many respects in a new point of view. Many ideas he advanced and the arrangement of his subjects were new, and consequently his terms became in part new. He impressed it upon the students that a knowledge of the

healthy and diseased actions or principles in their art are not less necessary to be understood than the principles of other sciences, unless the surgeon should wish to resemble the Chinese philosopher, whose knowledge consisted only in facts. In that case science must remain unimproved until fresh



JOHN HUNTER.

This picture was copied from a painting by Sir Joshua Reynolds, Hunter's friend.

facts arise. Too much attention cannot be paid to facts, yet too many facts crowd the memory without advantage any further than that they lead us to establish principles. By an acquaintance with principles we learn the causes of disease, without which knowledge a man cannot be a surgeon.

In his modes of lecturing to his students Hunter showed that it was

not his purpose to do this with a view to pecuniary gain, since the time thus expended might be employed much more profitably in extending his connections and in enlarging his practice. He spent the year 1761-2, after having been in practice ten years, by attending the British army as a surgeon in Portugal, without which experience he said he should have been unable to give an opinion concerning gun shot wounds, which rarely occur in civil practice. After his return he resumed the teaching of practical anatomy, became a fellow of the Royal Society in 1767, and also the nucleus of a small club that read and criticized each other's papers before these were submitted to the general body. This association proved of great value in expanding Hunter's mind and activities. He seems to have been singularly devoted to the pursuit of science, and especially physiological researches, and gathered a very extensive museum, which evidenced not only his perseverance, but also his genius.

He congratulated himself on having declined, in 1768, to become a teacher of anatomy, as that would have prevented him from giving his general attention to surgery, and he felt that the reading that would have been imposed upon him would have prevented him from establishing modes of thinking, but above all he says he was induced to lecture because of the advantage it gave him to put his thoughts into writing, and that a man never realizes how much he knows until he arranges his knowledge, and then he can tell how defective it is, and, therefore, it is, he says, that all authors of any consideration in physic have been public teachers.

He became a fellow of the Royal Society, but never received the "doctor's" degree. The plain title of "Mister" alone distinguishes him, although he held a commission as surgeon in the British army and distinguished himself by his scientific and surgical ability at Belle Isle. His collection of anatomical preparations and his observation of pathological conditions formed the basis upon which he constructed the principles which he taught. It is said of him that "whether under the tuition of his brother, or struggling for independence by privately teaching anatomy, or amidst the enticements to idleness in a mess-room, or as an army surgeon in active practice, he never seems to have forgotten that science was the chief end of his life."

His professional income was small, and only until a few years before his death did it reach a respectable sum. His museum was purchased by the government for fifteen thousand pounds, only a fraction of its real value. It was tendered the College of Physicians, which declined the trust, and was then committed to the College of Surgeons in Lincoln's Inn Fields, where it

is open to the inspection of the public. For many years this museum, now enlarged, has instituted professorships.

In the introductory preface of the "Surgical Works of John Hunter," published in London in 1835, edited by James F. Palmer, he is referred to as "the greatest man in the combined character of physiologist and surgeon that the whole annals of medicine can furnish."

The "Natural History of the Human Teeth" was written by Hunter in 1771, and in 1778 he published a monograph on the treatment of diseases of the teeth. It is said that from the proceeds of the publication of the "Natural History of the Teeth," which came a short time before his marriage, he derived the expenses that his wedding entailed upon him. The edition of his works published in 1835, in so far as it applied to his treatise on the teeth, is edited by Thomas Bell and annotated by him. He was at one time a pupil of Hunter. In this preface Bell observes that: "At the period Hunter wrote, dental surgery was perhaps lower than any department of professional science or practice. The treatment of the teeth was still consigned to the hands of the ignorant mechanics, whose knowledge was limited to the forcible extraction of aching teeth, the manufacture of substitutes for those which were lost, and some rude methods of filling the cavities produced by decay. That this practice (dentistry), by connection with physiological and pathological science, was improvable by such connection, should have early attracted the attention of a man preeminently qualified for supplying such deficiencies, whose labors, unparalleled as they are for their scientific importance, are not less valuable for the immense influence they have since exerted upon the practice both of medicine and of surgery, might have been anticipated. The peculiar character of his mind was too truly great to think any subjects unworthy of his anxious attention which involved the improvement of the art of healing or the extension of all knowledge of Nature's operations."

In his introduction to the treatise, John Hunter says:

"The importance of the teeth is such that they deserve our utmost attention as well with respect to the preservation of them when in a healthy state as the methods of curing them when diseased. They require this attention, not only for the preservation of themselves as instruments useful to the body, but also on account of other parts with which they are connected, for diseases in the teeth are apt to produce diseases in the neighboring parts, frequently of very serious consequences, as will evidently appear in the following treatise."

The condition, knowledge and education then possessed by the men who were practicing dentistry as a specialty, is somewhat illustrated in these words in the introduction:

"Diseases which may arise in consequence of those of the teeth are various, such as abscessed carious bones, etc., many of which, although proceeding originally from the teeth, are more the part of the surgeon than of the dentist, who will find himself as much at a loss to understand cases as if the abscess or carious bone were in the leg or any other distant point. All of the diseases of the teeth which are common to them with the other parts of the body should be put under the management of the physician or surgeon, but those which are peculiar to the teeth and their connection, belong properly to the dentist."

He continues further:

"In order that the reader may perfectly understand what follows, it will be necessary for him previously to consider and comprehend the anatomy and uses of every part of a tooth. * * * Without such previous study the dentist will often be at a loss to account for many of the diseases and symptoms mentioned here, and will retain many vulgar errors imbibed by conversing with ignorant people, or by reading books in which the anatomy and physiology of the teeth are treated without a sufficient knowledge of the subject."

In this book are chapters devoted to the decay of the teeth arising from rottenness, the symptoms of inflammation, and the stopping of the teeth. In the last mentioned chapter Hunter observes that gold and lead were generally the materials made use of in stopping the teeth—gold being less pliable must be used in leaf; lead being soft in any form as to take on any shape by a very small force. "Stuffing the hollow teeth with wax, galbanum, etc., can be of little service, as these substances cannot be confined, being soon worn away," he writes. The chapter further considers the decay of the teeth by denudation; the swelling of the fang; gum boils deeply seated; abscesses in the jaw and abscesses of the antrum. Hunter recommends the opening of the antrum by perforating the partition between it and the nose, or by drawing the first or second "grinder" of that side and perforating the partition between the root of the alveolar process and the antrum. In some cases, when part of the bone has been destroyed, he suggests that an opening be made from the inside of the lip where the abscess most probably will be felt. The drawing of the tooth is to be preferred, he says, because it is most apt to keep the opening from healing rapidly. ✓

The second chapter is devoted to the diseases of the alveolar process and their consequences; the third to the diseases of the gums and their consequences; the fourth to nervous pains in the jaw and the fifth to extraneous matter upon the teeth. He says that the removal of this adventitious substance is a part in which the dentist ought to be very cautious. He should perfectly master the difference between the natural or original teeth and the adventitious matter, and should be sensible of the propriety of saving as much as possible of the tooth, and, at the same time, to take pains to remove all that which is not natural. He says many persons have had their teeth wholly spoiled by injudicious treatment of them in this respect. As the cause of this incrustation is not either a known disease of the constitution or of the parts, but depends upon the property of the matter secreted, simply as inanimate matter, the remedy, of course, becomes either mechanical or chemical.

The sixth chapter is devoted to irregularities of the teeth and their treatment. The seventh chapter is devoted to the irregularities between the teeth and the jaw, and to supernumerary teeth. The eighth chapter is devoted to the under jaw; the ninth chapter to drawing of the teeth. The author observes that extraction should never be done quickly as that often occasions great mischief, breaking the tooth or jaw, on the same principle that a bullet going against an open door with great velocity will pass through it, but with little velocity will shut it. He further observes:

"It is a common practice to divert the gum from the tooth before it is drawn, which is attended with very little advantage, because, at best, it can only be imperfectly done, and that part of the gum which adheres to the tooth decays when it is lost. But if such a separation can be made and saves any pain in the whole of the operation, I should certainly recommend it, and at least in some cases it might prevent the gum from being torn. To close the gum after extraction can have no useful purpose, as it cannot be made to heal by the first intention. The cavity from which the tooth came must suppurate like all other wounds, but the inflammations and suppurations in these cases are not as great as in any other part of the body where so much substance has been removed."

A chapter is also devoted to the transplanting of the teeth.

Hunter says of transplanting the tooth: "The success of this operation is founded on a disposition of all living substances to unite when brought into contact with one another, although they are of a different structure, and even although the circulation is only carried on in one of them."

He experimented by transplanting a sound tooth drawn from a living person into the thick part of a cock's comb, having made an incision into this with a lancet. Into this the root of the tooth was pressed and tied in. Several months afterwards the cock was killed and the head injected. The comb was then taken off, put into weak acid, and having been softened by this, a longitudinal separation was made through the tooth and comb. The vessels of the tooth were found to be well injected and the external surface of the tooth was everywhere attached to the comb by vessels similar to the union of a tooth with the gum and sockets.

He observes that the operation of transplanting a tooth in itself presents little difficulty, but nevertheless it is one of the nicest of all operations and requires more surgical and physiological knowledge than any that comes under the care of the dentist. The first object of attention is the socket and the gums of the person who is to have the furnished tooth. In the operation of transplanting, the diseased tooth is to be first drawn. It will show the state of the socket; and the scion tooth is to be left or drawn, according to the appearance of the diseased one. He explains the use of the word scion and thought that as the operation is similar to that of the ingrafting of trees, he might transfer a term from gardening to surgery. He recommends in case the operation is not favorable that the scion tooth be not drawn, but that every dentist have on hand a number of dead teeth that he may have a chance to fit into the socket. In cases involved with "gum boils," he does not recommend transplanting, as these are always connected with diseased centers, although the disease originated in the extracted tooth. He treats of the age of the person who is to have the scion tooth, which should be a full grown, young tooth; young because the principle of life and union is much stronger in such than in old ones. He next treats of replanting a sound tooth when drawn by mistake, and then of transplanting a dead tooth and the immediate fastening of a transplanted tooth. He then speaks of dentition, of the cure and diseases arising from dentition, and of cutting the gums, which he strongly advises in all cases.

That transplanting of teeth was common dental practice at that period may be well inferred. In "A Practical Essay on the Human Teeth," by Paul Euralius Jullion, a surgeon dentist, published in London, in 1781, in a list of his "accustomed charges" is the following entry: "Transplanting a living tooth 5 pounds, 5 shillings; transplanting a death tooth, 2 pounds, 2 shillings."

John Hunter wrote many papers in the realms of anatomical, physiological

and pathological discovery. The "Muscularity of the Arteries," the "Life of the Blood," "History of the Human Teeth" and "Diseases of the Teeth" were among these. He died of angina pectoris immediately after a scientific discussion, at St. George's hospital, in which the conduct of his colleagues had provoked him, on October 16, 1793.

He was buried privately in the church of St. Martin in the Fields. Some time after his death his wife desired to erect a monument to his memory in Westminster Abbey, but the fees demanded for permission to occupy a niche within that venerable fane were too great for her reduced fortune, and she, therefore, abandoned her intention, and Mr. Palmer wrote in this 1835 edition:

"The author of the Hunterian museum needs no other memorial of his worth than the proud one he has himself erected; nor does he to perpetuate his fame. Still, it would be a fitting act of respect to his memory from those who enjoyed the benefits of this rich legacy of his genius, to enroll his name amongst those of the other gifted men whose worth stands recorded in Westminster Abbey."

Neither his wife, who wished to commemorate him, in 1796, by a tablet in Westminster Abbey, nor the editor of this edition, who thought him worthy of such a tablet, suspected that his body would be later removed and receive the highest honor that England bestows upon her most worthy.

The following lines are an epitaph written by his widow:

Here rests in awful silence, cold and still,
One whom no common sparks of genius fired;
Whose reach of thought Nature alone could fill;
Whose deep research the love of Truth inspired.

Hunter! If years of toil and watchful care,
If the vast labours of a powerful mind
To soothe the ills humanity must share,
Deserve the grateful plaudits of mankind,—

Then be each human weakness buried here
Envy would raise to dim a name so bright:
Those specks, which in the orb of day appear,
Take nothing from his warm and welcome light.

The London Dental Review, in its April number of 1859, tells us that in the early part of February of that year, Mr. Frank Buckland, assistant surgeon of the Second Life Guards, noticed an advertisement which

stated that by an order in council all coffins within the vaults of the church of St. Martin in the Fields would be removed. He remembered that John Hunter was buried in this church, obtained permission to search the parish register and found the following entry:

October 22, 1793.

Apoplexy. M. John Hunter, Esq. 6 10s. 2d.
Leicester Squar. No. Candles. $\frac{1}{4}$ past 4 o'clock.

V. N. 3. Duty 3rd.

After patiently searching, Mr. Buckland found the coffin containing Hunter's remains, and it is due to his public spirit that England had the opportunity of honoring the memory of John Hunter sixty-six years after his decease.

The council of the College of Surgeons applied to the dean and chapter of Westminster Abbey for permission to remove the remains to England's resting place for the illustrious dead. The permission was promptly given. The reinterment took place on the afternoon of Monday, the 28th of March, with simple and very unostentatious ceremony, at the usual three o'clock service. There was a crowded attendance, and an anthem appropriate to the occasion was impressively given. The magazine gives the following account of the obsequies:

"At the close of the service the coffin was borne round the Abbey, followed by dean of Westminster and Mr. Baillie, a grand nephew of Hunter; Lord Ducie and Dr. Clarke, of Cambridge, as representing the trustees of the Hunterian Museum; Mr. Buckland and Mr. Owen, the late Hunterian professor; Dr. Mayo and Mr. Green, the presidents of the Royal Colleges of Physicians and Surgeons; the council and professors of the college of Surgery; the censors of the College of Physicians; the master and wardens of the Apothecaries' Company; the council of the College of Dentists; the president of the Linnean Society; the president of the Royal Medical and Chirurgical Society; the president of the London Medical Society; the president of the Odontological Society; and the representatives of the London hospitals and medical schools, and many distinguished metropolitan and provincial surgeons.

"The remains were then lowered to their last resting place, in the north side of the nave, between Wilkie and Ben Jonson. Deep silence prevailed, which was only disturbed by the suppressed murmurs of some few disappointed ones, but doubtless the majority sympathized with ourselves. The marked silence was in character—the remains undisturbed for upwards of

sixty years—the reinterment amid solemn silence was to us far more touching than the most eloquent appeal. All present knew the worth of John Hunter, or they would not have taken part in thus honoring his memory. The coffin appeared in excellent preservation and bore the following inscription:

John Hunter Esq., died the 16th of October, 1793, aged 64 years.

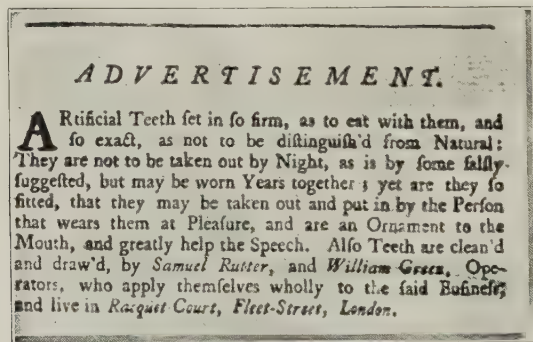
Beneath this the authorities of the Colleges attached another plate:

These remains were removed from the Church of St. Martin in the Fields by the Royal College of Surgeons of England, March 28th, 1859.

Aitken and Simpson labored to create extracting instruments which should enable the operator to extract teeth by perpendicular force, like the drawing of a cork from a bottle, instead of the oblique force necessitated by the instruments formerly employed, which was in reality a return to or modification of the earlier extracting instruments which the pelican and the turnkey had displaced.

The early part of the nineteenth century produced in England and France, Blake, Fox, Bell, Snell, Duval, Le Forgue, De La Barre, Beaume, Maury and many others, who by their writings added greatly to the dissemination of knowledge regarding the teeth, and furnished text books for the guidance of the early pioneers of the dental profession, who were deprived of the systematic instruction and training of the dentists of the present day.

The following fac simile of an advertisement published in 1749 may reflect the state of dentistry in England at that period:



SNELL, one of the early writers, observes that the cultivators of the dental art at all times were keen observers of the discoveries and expansion in other branches of learning, and were quick to apply them in either the

mechanical or chemical field. Then, as well as now, the progress and advancement in dental science and art was encouraged and had its way illumined by the side-lights shed upon it by the discoveries and achievements of the world's best thinkers and investigators in all the realms of scientific and mechanical activity. As long ago as 1831 this same writer uses this language: "Comparatively perfect as the art appears at present, we may reasonably hope that it will continue to participate in those important improvements which, in every department of human knowledge, are everywhere making around us."

He also indulged in this prophetic utterance: "The art will continue to advance; but it will be by the labors of men, who, with profound knowledge, unite solid judgment and extensive practical experience."

From the present point of view it may appear that our grandsires were as complacent regarding their attainments as many of their professional descendants of the present day. Casting a retrospect, however, of all that has been accomplished, we must concede that these pioneers had a broad and comprehensive estimate of the future possibilities of dentistry, and possessed a faith that was altruistic in its nature.

But then, as now, there was a class of men reaping some of the rewards to which the painstaking dentist is entitled. Their ways may not have been exactly like those of the parasites that now fatten upon the well earned reputation of dentistry, but they had "impudent pretenders, who are constantly pressing upon the public notice, their discoveries of new and infallible remedies, each of which turns out to be either a revival of some antiquated practice long since exploded, or such a novelty as could only have been devised by a mind innocent of all knowledge."

Dupont early in the seventeenth century, employed replantation as a curative method in severe odontalgia. He advised the extraction of the afflicted tooth and its immediate replacement, and claimed originality for this practice.

Highmore, in 1651, described the maxillary sinus, and the rational treatment of diseases of this cavity which he suggested are in most cases traceable to lesions of the teeth concerned.

Christophe Schelhammer filled teeth after extracting them and then replanted them.

THE AMERICAN COLONIES.

That the Cavaliers of the Old Dominion, that the Dutch along the Hudson or the Germans in Pennsylvania, in the early colonial days received any

operative attention in the care of their teeth by men especially devoted to this particular calling, or indulged in prosthetic substitution, is not established by any record now known, but the Pilgrim Fathers of Plymouth Colony appear to have treated their bodily welfare in this respect with the same considerate care and zeal as that actuating them in spiritual matters. In 1636 they brought into the colony from London some physicians, an apothecary and three barber surgeons. No record of those barber surgeons seems to be available, but owing to a singular catastrophe which overtook William Dinely, one of these, his name has been preserved. He was sent for in 1639 by a man living at Roxbury to come and relieve him from toothache, which was causing him intense suffering. The man sent his maid to show the way. Dinely and the girl were overtaken by a severe storm and lost their way. Several days after their bodies were found frozen to death.

JAMES MILLS—ROBERT WOOFFENDALE.

Just who was the first dentist practicing his profession as a specialty in the American colonies is not made entirely clear from annals available. It has been generally conceded heretofore that Robert Wooffendale, who came from England in 1766, was the first dentist to practice in New York, but in a paper published in the "Cosmos," in October, 1906, written by Dr. Kirk, undoubted evidence is submitted that James Mills antedated Wooffendale's arrival by thirty-one years. The "New York Weekly Journal," of January 6, 1735, contains this card:

Teeth drawn and old broken Stumps taken out very safely and with much care by James Mills, who was instructed in that art by the late James Reading, deceased, so fam'd for drawing teeth. He is to be spoke with at his shop in the house of the deceased near the Old Slip Market.

There is also in evidence an advertisement published in 1766 by one, James Daniel, a wig maker and hair dresser, and "also operator upon the teeth, the business so absolutely necessary in this City."

Robert Wooffendale, surgeon dentist, "lately arrived from London," announces through the public press in 1766:

Having received instructions from the present operator for the King's teeth, performs all operations upon the teeth, gums, sockets, and palate; also fixes artificial teeth so as to escape discerning.

The cards of Mills and Wooffendale, it will be noticed, differ materially in the services offered the public. Mills only claims proficiency in extraction

of teeth, whereas Wooffendale announces his capacity as a dentist, both in its operative and prosthetic field, which would fairly entitle him to recognition as the first dental practitioner of New York. Daniel only carried on dental operations as a side line to wig making and hair dressing, and, therefore, is scarcely entitled to consideration in the proposition for precedence.

ROBERT WOOFFENDALE,
Lately from LONDON, but last from NEW-YORK,
SURGEON DENTIST, (who was instructed
by THOMAS BERDMORE, Esq; operator of the
teeth to his *Britannic Majesty*) begs leave to in-
form the public, that he performs

All operations on the teeth,
gums, and sockets; likewise fixes in artificial teeth,
so as to escape discernment, and without the least
inconvenience.

N. B. He may be spoke with at his lodgings at
Mrs. Hunt's, opposite Mr. Roberdeau's, in Second-
street. *Philad. April 6, 1767.*

To be DISPOSED of,
An Irish servant girl's time,
who has three years to serve: She can wash, and
do most sorts of house work, is very handy about
children, and is sold for no reason but not suiting
the family she now lives in. For further parti-
culars inquire of the printer hereof.

A
TREATISE
ON THE
DISORDERS AND DEFORMITIES
OF THE
TEETH AND GUMS,

EXPLAINING
The most rational Methods of treating their Discases.
Illustrated with Cases and Experiments.

By **THOMAS BERDMORE,**
Member of the Surgeons Company, and Dentist in
Ordinary to his Majesty.

A NEW EDITION WITH ADDITIONS.

Dente quid horridius nigro, quid pulchrius albo?

L O N D O N:

Printed for the AUTHOR.

Sold by BENJAMIN WHITE in Fleet-Street;

JAMES DODSLEY in Pall-Mall;

And BECKET and DE HONDT in the Strand.

MDCCCLXX.

It seems that the Knickerbocker metropolis did not generally appreciate the distinguished abilities of a preserver and beautifier of the natural teeth and maker of substitutes for those lost, as Wooffendale returned to England in 1768. Dr. Kirk's article, however, further elaborates this record. It appears that Wooffendale was married, in 1767, to Martha Stevenson, and they removed to Jamaica, Long Island, but in January, 1768, he advertised in the "Post Boy" that he would visit New York on Thursdays. Forty years later his

wife died at Jamaica, and still later, in 1828, he died at the same place. From Harris' "Dictionary of Dental Sciences" of 1849 we learn that late in 1768 Wooffendale went back to England, where he remained until 1795,

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used to fasten artificial ones, is owing to the fault of those who apply wire instead of silk—Ligatures of wire certainly hurt the natural Teeth very soon, but silken twist cannot affect them in such manner in the space of a great many years.

The use of artificial Teeth is not confined to the cases where there are natural Teeth to which they may be fastened.—A whole set of artificial Teeth may be made for one or both jaws, so well fitted to admit of the necessary motions, and so conveniently retained in the proper situation, by the help of springs of a new and peculiar construction, that they will answer every purpose of natural Teeth, and can be taken out, cleaned, and replaced by the patient himself, with the greatest ease.—I say springs of a peculiar construction, because they are totally different

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ferent in shape and action from those which have been used by my predecessors; because they follow all the various motions of the jaw very freely; and because the pressure, which they give, is always equal and gentle, whether the mouth be shut or not.

When the gums are uneven or fallen away, the patient may have recourse to the use of *Artificial Gums*. This term sounds strangely, and makes no small shew in an advertisement. But the contrivance is nothing more than an artificial set of Teeth, carved, and stained at the lower edge, to represent the healthy gums. The deception is certainly good, and answers the purpose so well, that no-body in common conversation can distinguish the *artificial* from the *natural* gums.

F I N I S.

when he resumed his practice in New York, but continued only two years, and then retired with his family to his Long Island farm, leaving his professional business in charge of his son, John. By will he gave his dental instruments and the case containing them to this son, who was a surgeon dentist of New York, established at 84 Broadway. In 1807 he removed to No. 27 Partition (Fulton Street), opposite the "lower corner of St. Paul's church yard." He continued in practice as late as 1850.

Photographic reduced copies of the title page and of the last two pages of the text of the book published by Wooffendale's preceptor, in 1770,—which are here reproduced, give us a view of the progress made at that time in dental

prosthesis and literature, and also of the extent to which dental education was available to the first dentists who practiced in this country.

JOHN BAKER.

Contemporary with Robert Wooffendale at New York, according to an advertisement that appeared in the "Massachusetts Gazette and Boston News Letter," of Thursday, January 29, 1767, JOHN BAKER appears to have supplied the dental requirements of the Bostonians. This is his card:

John Baker, Surgeon Dentist, begs leave to take this method of informing the Publick: That he leaves this Place in Twenty Days at Farthest: That those who are disposed to apply to him may not be disappointed. He also begs leave to express his Gratitude for the Favors he has received while in Boston, and hopes that those who doubted the Safety of his Art from its Novelty in this Country are now convinced of its Safety and Usefulness. Until he leaves this Town he continues at Mr. Joshua Brackett's in School Street, where he will be ready to contribute to the utmost of his Power to serve the Publick in his Profession. His Dentifrice, with proper directions for preserving the Teeth and Gums, will be had at Mrs. Eustus's near the Town House, after he has left the Town. N. B. Each Pot is sealed with his Coat of Arms, as in the Margin of Directions, to prevent Fraud.

Baker evidently did not depart on schedule time, as on April 30th he again advertised that he would leave in ten days, but on May 9, 1768, we learn from an advertisement in the New York Weekly Journal that:

John Baker, Surgeon Dentist, Begs leave to acquaint the gentry of New York City that he has given proof of his superior art to the principal nobility, gentry and others of Great Britain, France, Ireland, and other principal places of Europe; also to 2,000 persons in Boston, and is now in the City at Mr. John Watson's, in the house where Captain Randall lately lived, on the corner of Pearl Street, where he fills teeth with lead or gold, so that they will remain fast for many years, and persons may eat, drink and sleep with them in their mouths as natural ones, from which they cannot be distinguished by the sharpest eye.

During Baker's stay of about fifteen months, in Boston, he instructed a patriot of the Revolution, PAUL REVERE, the hero of the midnight ride, who was an ivory turner and goldsmith, in dentistry, at least in its prosthetic branch, as will be seen from an advertisement published in Boston in 1768.

This Baker was also mentioned in the "Annals of Philadelphia," which states that when LaMaire arrived in Philadelphia, in 1784, he found there a dentist by the name of Baker, who, is it said, was the "first person ever known as a dentist in Philadelphia." The first directory published in the city of Philadelphia, in 1785, gives "John Baker, dentist, located on Second Street between Walnut and Spruce," and also gives Gardette as a dental

practitioner. Baker and he are the only ones mentioned, but as this directory states that only the names of permanent residents are given in it, it is possible that others may have practiced dentistry in an itinerant way prior to that date. In fact Dr. Kirk called attention to one, Michael Poree, who advertised in the "Pennsylvania Gazette" of July 6, 1781, as a surgeon dentist "just arrived from New York."

This Poree in 1769 advertised in New York to

Fix natural and artificial teeth, from a single one to a whole set, to appear as well and be as useful and easy as real teeth. He likewise cleanses the teeth and draws stumps, and lodges at Mrs. Cornwall's, two doors from the back of the Old City Hall.

In 1772 Poree was in New York opposite the "Bowling Green," and the year following found him in Boston.

From the "New York Chronicle" of June, 1769, it appears that Mr. Hamilton, surgeon dentist, from London was located at "Mrs. Buskirk's, corner of Wall Street, near the coffee house," and on August 17, an advertisement in the same paper conveys the information that he is located at "Captain Joseph Goldthwaite's in Back street," and recommends his "tincture" with which the most violent tooth-ache is cured in a few minutes without drawing, No cure, No pay."

On December 20, 1775, the Constitutional Gazette of New York announced the arrival of Dr. Dubuke, a Frenchman, from Boston, who was staying "at Mrs. Livingston's, opposite the Queen Charlotte Tavern, in Dock Street." This man, it appears, had traveled through the New England colonies. Having been convicted of stealing indigo, he departed from New York for the southern colonies, and was then lost sight of.

The "Constitutional Gazette" of 1776 refers to Leonard Fisher, surgeon-barber and dentist, who was located opposite St. Paul's Church in Charham row. He appears to have been permanently settled, as we find him, in 1790, at 114 Queen street and, in 1798, at 451 Pearl street.

"Gaine's Gazette" of June 9, 1877, contains an advertisement of Richard Dufort Dustwige, in which he is announced under the singular combination of midwife, oculist and dentist from Europe, who makes artificial teeth, "which perfectly resemble the natural." In March of 1778 he announces himself as located at 13 Duke street and informs the public that he would "sail for Europe next month."

In 1780, "Rivington's Royal Gazette" advertises Dr. Dustwige, at 276 Broad street, as having studied in the schools of Paris and as an operator on teeth and constructor of artificial ones.

This same gazette on August 24 to 28 and on August 31, 1782, published this advertisement:

Teeth.—Any person who is willing to dispose of his front teeth, may hear of a purchaser by applying to No. 28 Maiden Lane, for which generous price will be paid. N. B. Four guineas will be given for every tooth.

These teeth were probably wanted for replanting.

ISAAC GREENWOOD.

It has frequently been said that Josiah Flagg was the first native born American dentist, but when the genealogy of the Greenwoods is examined, we must conclude that the claim is not well founded, and that ISAAC GREENWOOD of Boston, may more justly be entitled to this distinction, but Flagg probably was the first native born dentist who especially and exclusively prepared himself for the practice of this profession.

Isaac Greenwood was the first permanent dental practitioner in the city of Boston. His grandfather, Nathaniel Greenwood from Norwich, England, came to Boston about 1650. He had two sons, Samuel and Isaac. Isaac became the first professor of mathematics and natural philosophy in Harvard College, Cambridge, Mass., having been previously appointed chaplain on board of Admiral Montague's flagship.

"He was afterwards called to preside over the congregation of the Old North Church, Boston, where he appears to have been regarded as a preacher of pure Christian doctrine, particularly urging upon his hearers the necessity of leading a life in accordance therewith."

He was the father of Isaac, whose name was mentioned in a newspaper in connection with the Boston massacre of March 5, 1770. In this he is referred to as an ivory turner, a business "naturally embracing that of dentist."

In 1860, Isaac John Greenwood of 142 West 14th street, New York City, then practicing dentistry, gave these additional facts with reference to the Greenwood family.

Isaac Greenwood II was born and lived at Boston, and was the first practitioner of dentistry in the family. He studied mathematics under his father, preparing himself to become a mathematical instrument maker, and about 1750 he was engaged in Boston as a mathematical instrument maker, wood and ivory turner, umbrella manufacturer and dentist. His grandson says that he followed all these pursuits at the same time, and that he made the first electrical machine for Benjamin Franklin. He based this assertion

upon information given him by his Uncle Isaac. As Benjamin Franklin, at the time of his electrical machine, was a resident of Philadelphia, the entire correctness of this statement might be questioned, as there is reason to believe that there were competent mechanics in that line available in Philadelphia at that time.

Isaac John Greenwood is unable to say how his grandfather obtained his information in dentistry. He says that he practiced it only in the construction of mechanical substitutes, but that in a portrait of him of life size, he is represented with his left hand and arm resting upon an open volume of Hunter's "Treatise Upon the Human Teeth," and "which portrait I have in my possession." He practiced the making of artificial teeth very many years previous to the Revolution. He used only bee's-wax moulds for making artificial teeth, which he constructed from hippopotamus teeth, and so did his father, John Greenwood, who practiced in New York from 1785 to 1820.

This Isaac Greenwood had four sons and one daughter: Isaac, Jr., John, William Pitt and Clark, and each of these obtained their dental information from their father in his shop at Boston.

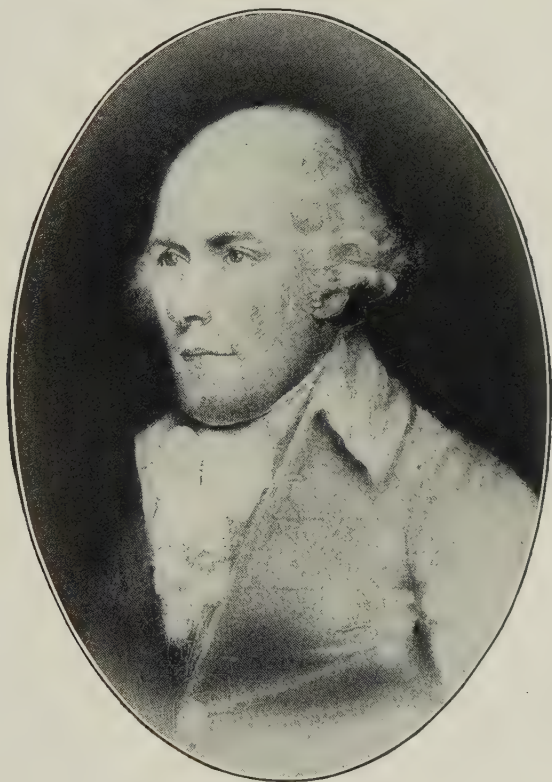
John, so his son says, never gained much information about the art of dentistry from his father, as he joined the revolutionary army at fourteen years of age, previous to the battle of Lexington, and was at the battle of Bunker's Hill, etc. After peace he practiced as a mathematical instrument maker, and quit that business to follow that, to him more profitable and congenial, of mechanical and surgical dentistry, which he continued until his death.

The third son, William Pitt, was instructed by his father in Boston. He was a perfect master of the profession and died wealthy as the result of his practice at Boston. The fourth son learned the profession from his father, but never practiced in New York City for any length of time, and the daughter's son, George Henry Gay of Dedham, Massachusetts, became a doctor, a surgeon and a dentist, and practiced dentistry in Boston for a number of years, acquiring a great reputation, "particularly in repairing and replanting palatial (palatal) deformities." William Pitt Greenwood and George Henry Gay, M. D., manufactured mineral teeth in their practices.

JOHN GREENWOOD.

JOHN GREENWOOD, second son of Isaac II, was born in Boston, May 17, 1760, and was sent to school, where he was one of three or four hundred boys

who received instruction in the rudiments of an English education by two teachers. So meager was this education that English grammar was not included in the curriculum.



John Greenwood

At the age of thirteen young Greenwood was apprenticed to his uncle at Portland, Me., who was a cabinet maker. He remained with this uncle for nearly two years when the troublous colonial times began. His uncle was a lieutenant in one of the companies organized in the revolutionary war and, as John Greenwood was quite proficient on the flute as well as the fife, he

became the fifer of that company. When news of the battle of Lexington reached Portland he became concerned about the safety of the parents, and on a "Sunday as a day on which he was least liable to be missed, and having put up a few articles of dress in a handkerchief and with four and a half pistareens in his pocket, he took an early breakfast, jumped over a back fence and was on his way to Boston." He walked forty miles the first day without feeling fatigued. He was made the recipient of much adulation from the people along his route, many of whom were preparing to march to Boston, and to whom his fife was greatly inspiring. He was detained by sentries and compelled to go to Cambridge to obtain permission from General Artemas Ward, the first commander of the Continental army, to cross the ferry near which, on the Boston side, his father resided. He, however, was not allowed to cross. John Greenwood then, in May, 1775, enlisted in Captain Bliss' Company and became its fifer.

Having an aunt residing at Andover, he obtained permission one day from his captain to visit her, but before having reached his destination he was impelled by some unaccountable power to retrace his steps and returned to his company just in time for the battle of Bunker Hill. He wrote concerning it as follows:

"On my way there I met on the road many wagons and chairs filled with the dead and dying, and others not so badly wounded, who were enabled to walk by the assistance of others. This sight was entirely new to me and, I must acknowledge, alarmed me considerably, and at that moment I thought I would have given anything in the world if I had not enlisted for a soldier. But my fears were quickly dispelled by witnessing the fortitude of a poor negro, who I had observed had a wound in the back of his neck from which the blood flowed copiously. I observed that he appeared to be quite indifferent to his wound as if free from pain. I asked him if it hurt him much. He said, 'no,' and as soon as it was dressed he would return to the battle. His courage seemed to have an electric effect on me and in an instant I felt as brave as himself, and never again allowed myself to be influenced by fear during the continuance of the war."

After the evacuation of Boston by the British, young Greenwood marched with his regiment to Montreal in the expedition under General Arnold, and with those who escaped the Indian massacre reached Lake Champlain and finally Ticonderoga. He wrote of this:

"I employed much of my time in playing lively tunes on my fife for the

purpose of cheering up my comrades, especially the sick, and took every opportunity of making them comfortable as far as it was in my power."

He then moved to Albany, from thence by water to Esopus and from there marched to Newtown, Pennsylvania, and then to Trenton, New Jersey. The day after the battle of Trenton, his term of enlistment having expired, he made up his mind to quit the soldier's life and set out on his return to his parents in Boston. After a visit in his Boston home, he again entered the service and became a privateer's man, and served until the close of the war, after which he settled in New York City. A friend helped him to start the business of nautical and mathematical instrument making. As he proved himself a very skilled mechanic, a physician friend of his at one time asked him to extract a tooth for one of his patients, which he did so satisfactorily that this physician recommended him to others of his patients for like services.

Shortly after he began to practice dentistry with the determination to master all of its problems. He must undoubtedly have gathered considerable information from the experience in the line of this profession which observation of his father's practice and that of his brother made possible to him. He did not confine himself to the usual routine of dental practice of that day, but entered upon the broader field of surgery and treatment of the maxillary sinus.

Whether an incident in his early military career may not first have brought him to the attention of General Washington, and formed an acquaintance that later became the professional introduction of Mr. Greenwood, is problematical. Greenwood's mother left Boston to get her boy out of the "rebel" army, and was prevented from returning to Boston, for a number of weeks, by the Continental authorities at Cambridge, until General Washington came to take command of the army, when she applied to him for permission to return, which was very graciously granted, but, it is said, against the vigorous protest of many of the Massachusetts officers.

The first advertisement by John Greenwood now known was published in the "Daily Advertiser" of New York on February 28, 1786:

WHITE TEETH—A GREAT ORNAMENT.

John Greenwood, dentist, No. 199 Water Street, Encouraged by the success of his practice, begs leave to acquaint the publick that he preserves the Teeth and Gums by removing an infectious Tartar, (etc).

In July 1791 he removed to No. 5 Vesey street, and his removal card published in the "New York Weekly Museum" of July 28th of that year says:

John Greenwood, Surgeon Dentist and Operator for the Teeth, Has removed to No. 5 Vesey Street, side of St. Paul's Church. Whose abilities are universally approved by seven years' successful practice in this City. He transplants, makes and cleans the teeth as usual. Price as follows:

Transplants teeth—3 guineas each.

Grafts natural teeth—3 dollars each.

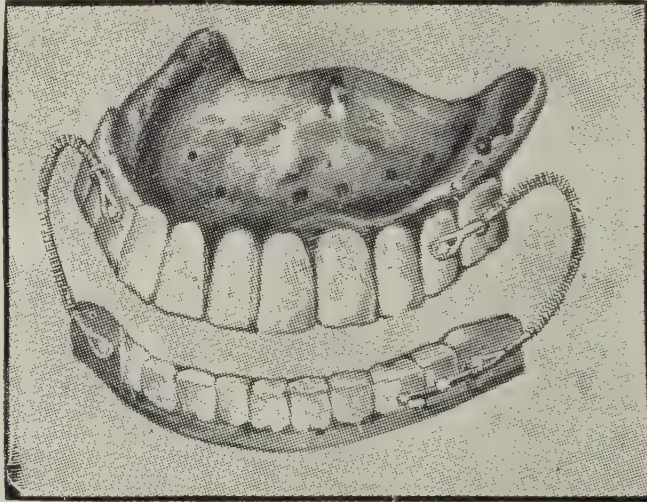
Makes and fixes artificial teeth—8 to 20 s. each.

Cleans the teeth—from 8 to 20 s.

He has a peculiar method of fixing artificial teeth, which are not equalled by any other artificial teeth, as to beauty, firmness or durability.

Tooth Powder—2/6 per box.

N. B.—Patent and all kinds of electrical machines, with medical and experimental apparatus for sale. Enquire as above or at Mr. Clark Greenwood, mathematical instrument maker, No. 199 Water Street, opposite the Coffee House.



Full set of teeth made by John Greenwood for and worn by General Washington, now in the museum of the Baltimore College of Dental Surgery by whose kind permission it is published.

On January 6, 1795, General Washington sent the following letter from Mount Vernon to Mr. John Greenwood:

Sir: Your letter of the 28th ult. with a parcel that accompanied it, came safely to hand. I feel obliged to you for your attention to my request and for the direction you have given me.

Enclosed you will find bank notes for fifteen dollars, which I shall be glad to hear

have got safe to your hands. If you should return to Connecticut, I should be glad to be advised of it, and to what place, as I shall always prefer your services to those of any other in the line of your present profession.

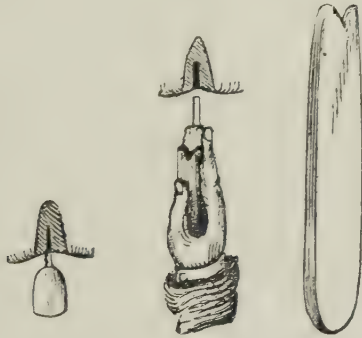
I am, sir,

Your very humble servant,

G. WASHINGTON.

Although Fauchard, in 1728, describes the use of flat springs, and de Chamant, a few years later, spiral springs as a means of holding upper and lower substitutes in position, it is claimed by his son that John Greenwood was the first to employ these in dental practice in the United States.

John Greenwood went to Paris about 1806, his son says, to procure a



Isaac John Greenwood's method of inserting pivot teeth on wood pivots.

keg of natural human teeth. After his return from France he announced in the "Weekly Museum" of March 7, 1807:

J. Greenwood, Surgeon Dentist,—Informs his friends and the publick in general that he has returned from Paris, with great improvements in the line of his profession, and attends to his business as usual at No. 83 Beekman Street.

He died November 16, 1819 at the age of fifty-nine. He was succeeded in his practice by his two sons, Isaac John and Clark.

ISAAC JOHN GREENWOOD.

Isaac John Greenwood, the son of John Greenwood, is authority for the following statement:

"There was buried, in the tomb at Mount Vernon, in the mouth of George Washington, a pair of false jaws with human teeth on, which were

made by my father, John Greenwood, in 1799, and they were made with bone gums—I think of the elephant's teeth or ivory, and made from moulds of bee's-wax.

"My brother, Clark Greenwood, deceased, and myself did not use plaster of paris until about 1820," he continued, "and I think it was through my own suggestion. We hardened them by dipping the plaster moulds into boiled linseed oil and let them dry. Before that time white and yellow bee's-wax was much in use for plate and bone work, even for half and whole sets of teeth. I never had a set returned to me on account of the fit. I think I was the first in New York who set natural human teeth upon bone gums and colored the gums to life, after those made for General George Washington by my father in 1799."

Isaac John Greenwood claims to have used a steel burr in a lathe, his own invention, in the year 1823, which a Scotchman, by the name of Morgan, made for him in New York, and which he used for excavating the cavity for the gums to rest on, "in parts of, and whole sets of teeth."

He also claims to have been the first to discover and use wooden pivots in bone or mineral teeth. He tells us that the first mineral tooth he ever saw was brought to this country by Aaron Burr, who was a patient of his father, and presented this to him. He relates:

"In the first years of my practice metallic pivots to teeth were used, and screwed into the material of bone or human teeth (or sea-horse, sheep or oxen), and cotton was wrapped around the metal pivots to keep them in the sockets of the roots, which, when decomposed, would give an offensive odor; and with me it was a great point to endeavor to find a remedy to prevent these bad effects, and to keep the teeth sweet and clean as possible, which I soon was enabled to remedy."

While operating in 1825, for an English gentleman who had called upon him to fasten a single tooth, he discovered that the root had been bushed with bass wood or soft maple, and this wooden plug had been perforated so as to hold the gold pivot firmly in place. Finding that there was very little odor arising from the root in this case, and finding that the wood had answered the purpose well, the idea of using wood entirely for a pivot occurred to him, and he found that the substitution of straight grained (white part) hickory wood gave him perfect satisfaction. He obtained thoroughly seasoned wood for this purpose at that time which lasted him until he discontinued practice in 1841. Of these he writes:

"They lasted so well that I was often forced, when they broke off from

friction wearing the wooden pivot off, to redrill the cavity with the end of the pivot in it out again, to replace it by another wooden pivot. After this, except in extraordinary cases, I never used metallic pivots for single teeth, and the mouth was sweet and clean by those who were careful to brush their teeth regularly."

He credits his father, John Greenwood, with being the first to use the "foot drill" in dentistry, having constructed one out of an old spinning wheel belonging to his grandfather. This he also used, after his father's death, for twenty years. He states that the hand bow-drill was well known prior to that time, but that he had never used the hand drill to perforate the roots of teeth for pivots, "but a drill instrument with a spear-shaped point gauged for the depth of the pivot, to drill the roots to receive the wooden or metallic pivot; but to make the hole to receive the pivot in the tooth, I always used the foot-drill." He claims to have been the first dentist who had mineral teeth prepared with holes in them to receive wooden pivots.

ISAAC GREENWOOD, JR.

In 1783, ISAAC GREENWOOD, JR., brother of John Greenwood, ivory turner and dentist of Boston, came to New York as soon as the British had evacuated and advertised himself as a dentist "at Mrs. Richardson's House No. 24 Old Slip." His card printed in "Rivington's Gazette" of December 24th reads as follows:

Mr. Greenwood, Surgeon Dentist (lately arrived in this City), Begs leave to acquaint the publick that he Preserves the Teeth and Gums by removing an infectious Tartar that destroys them and renders the natural purity of the breath offensive. He cures the Scurvy in the Gums; also fastens the teeth by causing the gums to grow up and adhere to them. He extracts and replaces the Teeth, and makes them white. He substitutes Artificial Teeth in so neat a manner as not to be perceived from natural ones, without drawing the stumps or causing the least pain. They give a youthful air to the countenance, and render pronunciation more agreeable and distinct; in a word both Natural and Artificial are of much real service—it is a folly to neglect them. And as he would ever have his work recommend him, he requires no pay from those who are not completely satisfied with his performances. He has Pills for the Tooth Ache, that seldom fail to give relief; likewise boxes of Teeth Powder and Brushes that will recommend themselves. N. B.—Mr. Greenwood will with pleasure attend those Ladies and Gentlemen who cannot conveniently wait on him at his room in Mrs. Richardson's house, No. 24 at the Old Slip in New York.

He left New York in 1785 to locate in Charleston, S. C., but for some reason or other he concluded to return north and then settled in Providence,

R. I., where he remained until 1810, and then again established himself in New York, this time, it is said, as the successor of his brother Clark, in the business of a mathematical instrument maker.

In an article in the Providence, R. I., "Journal" of October 26, 1858, in an obituary tribute to Dr. William Bradley, who was supposed to have been the first dentist of that city, is this notice: "Dr. William Bradley died in Philadelphia last week. He was a man of much skill in his profession and highly estimable in private life." This same paper for October 27th prints a letter from "W. H. H.," who says:

Dr. William Bradley, whose decease was mentioned in yesterday's "Journal," was not as stated the first dentist who practiced in this city. Dr. Isaac Greenwood was the first who followed that art as a distinct profession here. His advertisement appears in the "Providence Gazette" as early as the year 1788, and in it he alludes to his having had nine years' practice in his business. He was the brother of Dr. John Greenwood of New York, who, in 1789, made an upper and lower set of teeth for General Washington. * * * But of Dr. Bradley's superior skill the writer as one of his successors, can bear a willing testimony. * * * Many teeth filled by him under favorable circumstances, though the work was performed thirty or forty years ago, are still preserved and the fillings as good, apparently, as when first inserted.

WILLIAM PITT GREENWOOD.

John Greenwood's younger brother, William Pitt Greenwood, assisted him for a time, and then in 1790, established himself in Salem, Mass., as a dentist, and later removed to Boston, where he continued in the practice of dentistry until very old age caused him to retire. In November, 1840, the Baltimore College of Dental Surgery conferred upon him the honorary degree of Doctor of Dental Surgery, being one of the earliest degrees thus conferred. In July, 1842, at the meeting of the American Society of Dental Surgeons held in Boston, he greatly interested and entertained that body with the story of his fifty years' experience as a dentist.

He died at Boston, May 10, 1851, on his eighty-fifth birthday.

Another patriot of the Revolution, PAUL REVERE, the hero of the midnight ride, who was an ivory turner and goldsmith, also practiced dentistry, at least in its prosthetic branch, as will be seen from an advertisement published in Boston in 1778.

JOSIAH FLAGG.

Little is known of the earlier life of JOSIAH FLAGG. We find him a youth of eighteen in the Continental army. When the allied French and


Continental forces were resting in winter quarters near Providence, R. I., in 1781-82, Josiah Flagg, Joseph Le Maire and James Gardette frequently met during those cold wintry months and Flagg learned much from them of the dental art in which these Frenchmen were then very proficient. After



JOSIAH FLAGG.

the war closed, he established himself as a dentist in Boston, having first, however, carried on an itinerant practice in the various cities and towns in the vicinity. A very interesting document, which graphically portrays what dentistry was and how dentists obtained a practice at the end of the eighteenth century, was some years ago published in the "Boston Medical and Surgical Journal." It is an advertisement in a Boston newspaper of Josiah Flagg, surgeon dentist, which is here reproduced in its original form.

The document is ornamented in one corner by formidable and antiquated instruments, while in the other are to be seen tooth-brushes quite of the modern pattern. It has been preserved by a descendant of one who, as may



JOSIAH FLAGG,

Surgeon Dentist.

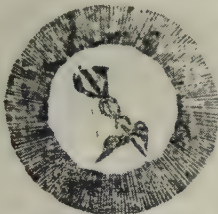
Informs the public, that he practises in all the branches, with improvements. [*i. e.*] Transplants both live and dead Teeth with greater convenience, and gives less pain than heretofore practised in Europe or America :---Sews up Hare Lips :---Cures Ulcers :---Extracts Teeth and ~~champs~~ ^{champs} or roots with ease :---Reinstitutes Teeth and Gums, that are much depreciated by nature, carelessness, acids, or corroding medicine :---Fastens those Teeth that are loose ; (unless wasted at the roots) regulates Teeth from their first cutting to prevent feavers and pain in Children :---Assists nature in the extension of the jaws, for the beautiful arrangement of the second Set, and preserves them in their natural whiteness entirely free from all scorbutic complaints---and when thus put in order, and his directions followed, (which are simple) he engages that the further care of a *Dentist* will be wholly unnecessary :---Eases pain in Teeth without drawing :---Stops bleeding in the gums, jaws or arteries :---Lines and plumbs Teeth with virgin Gold, Foil, or Lead :---Fixes Gold Roofs and Palates, and artificial Teeth of any quality, without injury to and independent of the natural ones, greatly assisting the pronunciation and the swallow, when injured by natural, or other defects.---A room for the practice with every accommodation at his house, where may be had *Dentifrices* Tinctures, Teeth and Gum Brushes, Mastics, &c. warranted approved and adapted to the various ages and circumstances :---Also Chew-sticks, particularly useful in cleansing the fore Teeth and preserving a natural and beautiful whiteness ; which Medicine and Chew-Picks are to be sold wholesale and retail, that they may be more extensively usefull.

* * DR. FLAGG. has a method to furnish those Ladies and Gentlemen, or Children with artificial Teeth, Gold Gums, Roofs, or Palates, that are at a distance and cannot attend him personally.

£- CASH Given
for Handsome and Healthy Live TEETH,
 At No. 47, Newbury-Street, BOSTON, (1796.)

be seen in the back, purchased a brush and tincture from Josiah Flagg in the year 1800.

This advertisement indicates that gold for filling teeth was used in this country almost from the beginning of dentistry here.



DIRECTIONS by Dr. J.
FLAGG, to use his DENTIFICES,
or TINCTURES, (viz.) Uke Cold
Water, and a Brush, every day after
rubbing the Gums hard with your

~~finger to make them bleed what you can - rinse them~~
clean with Cold Water, holding the water in your mouth
untill the keenness of the air is off before you apply it to
your teeth : After which use with the Brush the war-
ranted and approved Antiscorbutic *Tincture*

But not rinse it off for some time : ——— It may be used
every day for the first week or ten days, and once or twice
a week afterwards at discretion : ——— When once in
good order, there is no further need of a DENTIST or
Medicine. — NB. Fear not the stiffness

*of the brush; — And if your Tincture
is too potent for the gums, add to it
Port Wine to your liking; But
not mix the whole in the trial. —*

To Mr. J. Green.



Joseph Flagg

May, 1800

During the war of 1812, Josiah Flagg again entered the service; this time in the navy. He was captured and carried to England a prisoner of war and paroled, and used the time of his captivity by accepting courtesies from the great surgeons and scientific men of London, who gave him every opportunity to expand his knowledge. His reputation as a Boston dentist of note had preceded him to England before the war. His social standing brought him in close relations with distinguished teachers, among these was Sir Astley Cooper, whom he at times assisted in his operations in Guy's hospital, and whose lectures he was permitted to attend. After the close of the war he returned to Boston, prepared to give to his people the benefit of his expanded knowledge and skill. Unfortunately his health soon became impaired, and a change of climate becoming necessary, he moved to Charleston, S. C., where he died on September 30, 1816, at the age of fifty-three.

JAMES GARDETTE.

JAMES GARDETTE, who was born in France in 1756, studied medicine two years in Paris, served in hospitals at Toulon and became a surgeon in the French navy, is credited with having been the first medically educated dentist in the United States. He came to this country with the contingent sent by France under Count de Rochambeau to aid the American Colonies and began the practice of dentistry in New York City, in 1783, whence he removed to Philadelphia, in 1784, where he established a large practice and great reputation. In 1829 he returned to France and died at Bordeaux, in 1831.

JOSEPH LE MAIRE.

JOSEPH LE MAIRE came with the land forces of France as a young officer. He had been a dentist of Paris, but dropped his civil pursuit in the interest of liberty, like many other French men of rank and position of his day. He first established himself in Philadelphia, in 1784, shortly before the arrival of Gardette. According to "Watson's Manual of Philadelphia" there was a dentist by the name of Baker in that city prior to the arrival of these Frenchmen, but when he came there, or commenced to practice, is not recorded.

Dr. Hayden in the "American Journal of Dental Science," Volume 2, first series, says of Le Maire:

"The first hints that were afforded or opportunities offered to any person to obtain a knowledge of the profession were, we believe, through a French

dentist by the name of Le Maire. He offered his services to the public during the Revolutionary War. * * * He was not without some pretensions to skill in the practical operations, especially in transplanting teeth. * * * He likewise undertook to instruct some two or three persons in the profession, which may be considered as the origin of dentistry in this country. Dr. James Gardette mentions Le Maire (Lemayeur) as one who had the reputation of an eminent dentist in Philadelphia when he arrived in that city in June, 1784."

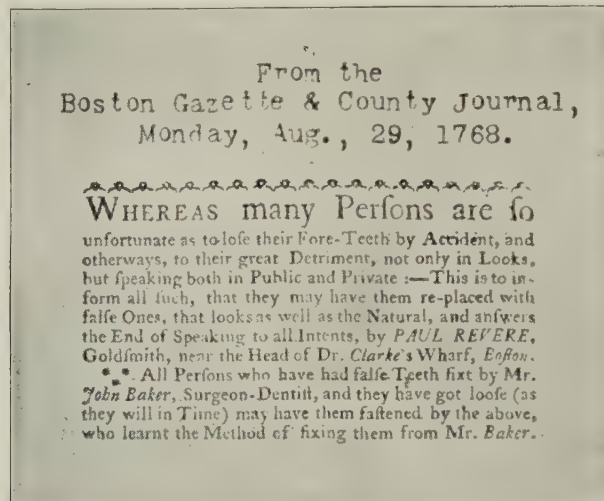
One Whitelock also is mentioned as eminent as a dentist by Dr. Hayden and as a "gentleman of polite address and accomplished manners," who entered this country about the same time as Le Maire as a member of a company of theatrical performers who were induced to come here through the rage for theatrical performers" which was then prevalent.

Dr. W. H. Trueman wrote of these men some years ago:

"When Gardette resolved to enter the navy, as part of his profession as a naval surgeon he received instruction in dentistry from M. Le Roy de la Faudiniere, a distinguished dentist of Paris, and provided himself with dental text-books and instruments. This was required of naval surgeons in the French service in 1777. We have no reason to think that he contemplated the practice of dentistry when he left France other than as part of his work as a naval surgeon. He soon acquired a distaste for the sea, and resigned his position. During the winter of 1781-82, the war then being virtually over, the French and American armies were in winter quarters side by side near Providence, R. I. In that camp, relieved of the tension associated with active service, and expecting soon to resume civil life, we find, in intimate friendship, Joseph Le Maire, James Gardette and Josiah Flagg. Le Maire had, now and again, to the great comfort and satisfaction of his companions, performed dental operations for their relief, and now many of the officers and others took advantage of the opportunity to secure his services. Josiah Flagg had been greatly interested in Le Maire's work, and proved an apt and zealous student. Gardette also embraced the opportunity of adding to his dental knowledge already gained.

"It needs but little stretch of the imagination to locate the first school for dental instruction in the United States, and the first dental meeting for mutual improvement, around this revolutionary camp-fire. We may safely say that scientific dental surgery in the United States owes much of that which has been given it its well merited reputation to the good work there done in 1781-82.

"Not only did those connected with the army have opportunity to observe and receive the benefits of skilled dental services, but the presence of the army in its then inactive condition attracted from all parts of the country many of our best citizens. When the army disbanded, the merits and advantages of dental attention were made known far and wide, as they could have been so quickly by no other means. This created a demand, the return of peace and prosperity furnished the means, and we soon find dental prac-



titioners in all parts of the land. Toward the close of the last century our profession in the United States was well established and fully appreciated."

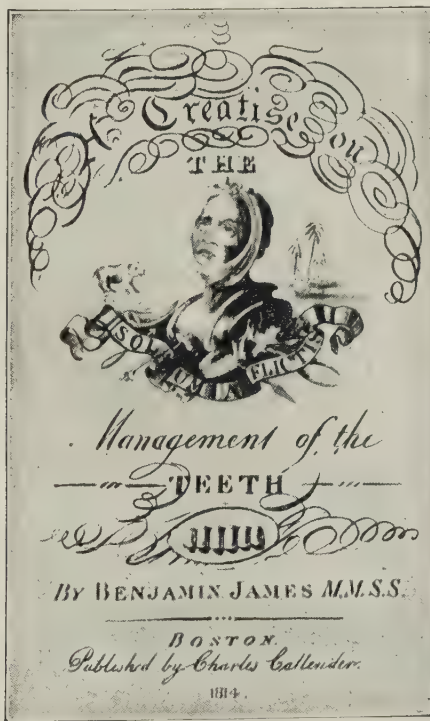
From the "Constitutional Gazette" of April 24, 1776, of Boston, it is learned that the body of General Joseph Warren had been reinterred at Boston on the 8th, the general's remains having been found on the fourth inst. about three feet underground on Bunker Hill. They were known by the two artificial teeth, fastened by a gold wire. It thus appears that the work of the dentist became a recognized means of evidence for identification of dead human bodies before the birth of our nation. Whether these teeth were the handiwork of Greenwood, the progenitor of the several generations of that name, of Paul Revere, or of Baker, from whom Revere learned the art, remains unexplained.

During Baker's sojourn of about fifteen months in Boston, he instructed

a patriot of the Revolution, PAUL REVERE, the hero of the midnight ride, who was an ivory turner and goldsmith, in dentistry, at least in its prosthetic branch, as will be seen from an advertisement published in Boston in 1768.

THE NINETEENTH CENTURY: EFFORTS TO EDUCATE THE PUBLIC.

Early in the nineteenth century the dentists of note appreciated the necessity for the education of the public with reference to the importance of the



teeth, and published brochures, essays and books for that purpose, which undoubtedly contributed greatly, not only to the possibilities of dentistry in its conduciveness to health of the laity, but must also have been the stimulus that prompted many of the earlier practitioners to enter the profession. Such a book on the management of the teeth, published by Benjamin James, M. M. S. S., and printed in Boston, in 1814, reveals the condition in that

city at that time. The title page with its engraving is reproduced. It is full of suggestiveness. In the preface the author indulges in these observations:

"When, through negligence, many of them (the teeth) have decayed, and the remainder are rapidly falling into the same condition; it is pleasant to learn, that the diseases may be stayed; that the places of the absent teeth may be supplied with others, both useful and ornamental; and that those which have become partially diseased may be rendered of service to us, as we continue our attentions.

"The hollow cheek, the putrid saliva, which contaminates the whole system, the foul breath, and days and nights of agony are not the worst consequences of our neglect; the un pitying and murderous hand of the dentist is, alone, a sufficient punishment for our carelessness.

"The great impositions which have been practiced by some who call themselves dentists, render it necessary that every one who values his teeth should be able to distinguish the imposter from him who understands his business.

"Most people may be deceived at the time of an operation, though woful experience in a few months unfolds the deception. The imposter is sought for to make reparation, or to receive merited punishment, but the bird has flown; he is gone to practice his tricks and deceptions among those who know not his character, until prudence drives him into another seclusion from revenge, into another 'shoal of gudgeons.'

"In all occupations it is safer to employ those only whose permanent residence enables us, at all times, to call them to account for negligence or deception. The itinerant dentist ought, therefore, never to be trusted."

A similar work under the title of a "Popular Essay on the Structure, Formation and Management of the Teeth," by the late Mr. Fuller, was published in London in 1815, with introductory observations by Richard Downing (surgeon dentist).

In his introductory chapters Downing states that the natural history of the teeth had not commanded any particular attention in England until the publication of the book of John Hunter, in 1771, but since that time the teeth had received their share of notice in the lectures on physiology, and courses of lectures had been instituted expressly on them. The first distinct course of lectures on the teeth was delivered by "the late Mr. Rae, surgeon dentist to the king," whose early death, however, by a fall from a horse, terminated the course. In 1799, Joseph Fox commenced a course of lectures on the structure and diseases of the teeth, which he continued to

deliver afterwards at Guy's hospital. This popular treatise was written on the lines of the teachings of John Hunter and Joseph Fox.

Downing mentions that great improvement had been made of late in making artificial teeth of porcelain composition, instead of sea horse bone, and further comments that, where cost is no object, the superior cleanliness and incorruptibility of such artificial teeth entitled them to preference. His suggestion that the persons who require artificial teeth would find "themselves better served by a practitioner of established repute than by those whose cupidity permits them to set truth and even common sense at defiance." seems but another form of stating the same condition that was represented as existing in Boston a year earlier. Thus, we see, the metropolis of old England and the metropolis of New England were practically laboring under the same conditions at that time so far as practitioners of dentistry were concerned.

THE ARCHITECTS OF DENTISTRY IN THE UNITED STATES.

There were a few men in the United States in the beginning of the nineteenth century who may well be called the architects of dentistry as a separate calling and profession. While the structure they designed and reared, through the force of circumstances surrounding them during the process of construction, was built separate and apart from that of the medical profession, it is, nevertheless, an undeniable fact that these early builders were in the great majority men who had had in their earlier years more or less of a medical training.

EDWARD HUDSON.

EDWARD HUDSON, one of the earlier Philadelphia dentists, and who left a lasting impression behind him, was born in Ireland, in 1772. His parents, who belonged to the religious Society of Friends, died while Hudson was very young, and a cousin of his, who was then a dentist in Dublin, adopted Edward as his son, educated him in Trinity College, and later instructed him in dental surgery as a student in his office. It is said that while Hudson was at Trinity College that he developed great ability in debate, which brought him in contact with such of the distinguished men of that era and country as the Poet Moore, and Emmets, Sheares and Corbetts. Hudson became involved in the political movements of the day, was arrested and imprisoned in Fort George, Scotland, and when released from prison, 1802, removed to America and commenced the practice of dentistry in Philadelphia, in 1805. He is represented as a man of exceptional character

and uprightness, honesty and kindness, which, in addition to his professional skill, resulted in the upbuilding of a very comfortable practice.

Chapin A. Harris said of him that he was "idolized by his patients as few of his professional brethren can ever expect to be." One of his compeers, Eleazar Parmly, said of him: "We are probably more indebted to his success than to that of any other man for the importance which was attached at that period to operations which were intended to preserve the natural teeth in their natural state," for "by the complete success attending the practice of this great man, the public were soon convinced that teeth could be saved."

HORACE H. HAYDEN.



Horace H. Hayden M.D.D.D.L.

HORACE H. HAYDEN, whose influence in the development of an organized dental profession is probably equaled or exceeded only by that of Chapin A. Harris, was born in 1768. When fourteen years of age he made a voyage to the West Indies in the capacity of cabin boy, and later was apprenticed

to an architect, in which pursuit he labored for eight or nine years. Being in New York and needing the services of a dentist, he met John Greenwood. While undergoing treatment he conceived the idea of becoming a dentist himself. Guided, no doubt, by Greenwood, he procured such text books as were obtainable, and, possessed of mechanical skill, perfected himself in the dental art, and, in 1804, established himself in Baltimore. He studied hard and gained all the information he could, and gradually began to build a repu-

H. HAYDEN,
DENTIST,

OFFERS his sincere thanks to those ladies and gentlemen who have honored him with their confidence, and respectfully informs them and the public in general, that he has returned from Annapolis, and will be happy to merit a continuance of their favors.

From the encouragement he has received in this, and the neighboring towns, and the opportunities he has had of proving his abilities, he deems it unnecessary to enter into a detail of the different operations which come within the line of his profession; In no instance does he presume to attempt, unauthorized either by his own experience or those who have rendered themselves justly celebrated in their profession—Fauchard, and Bourdet of Paris, and others.

If delicacy and tenderness in the different operations required on the teeth and gums, beauty and elegance in the finishing and setting natural and artificial teeth in a variety of ways, are inducements, those who favor him with their custom may be assured of the same to their satisfaction, or the operation will be acknowledged gratis.

Those ladies and gentlemen wishing to be waited on at their places of abode will please to send a line or servant to No. 149 Market Street,

March 24. cc2w

The character and manners of Hayden may be gleaned from an advertisement which is here reproduced.

tation. It was he who first conceived the thought that the dental profession was worthy of higher public esteem and a more exalted scientific position than it occupied at that time, and he realized that such higher position could only be gained by a better scientific training. Hence he took up the study of general medicine while he continued to practice as a dentist. His efforts in this direction were later rewarded, both by the University of Mary-

land and Jefferson College of Philadelphia, which conferred upon him their honorary medical degrees. In 1825, the University of Maryland invited him to deliver a course of dental lectures to its medical class. In 1839, he, in conjunction with others, petitioned the Legislature of Maryland for the establishment of a college for the education of dentists, of which the Faculty was to consist in part of medical and in part of dental practitioners. When this school, the Baltimore College of Dental Surgery, was established, he accepted the chair of dental physiology and pathology, having then arrived at the age of seventy. In 1840, when the American Society of Dental Surgeons was formed, he became the first president, and was annually reelected until, on January 26, 1844, death discontinued his material career.

JOHN RANDALL.

JOHN RANDALL was born in 1773. He graduated at Harvard in 1802, then studied medicine with Dr. John Jeffries of Boston, and practiced both medicine and dentistry in 1805. His attention was drawn to dentistry somewhat in the same way as Dr. Hayden's. While still at Harvard College, he was forced to consult a dentist on account of some trouble with his teeth, but was frankly told by the practitioner to whom he applied that he could not do anything to preserve his teeth, as it was his business to put in new teeth. This is said to have rather startled young Randall, and led him to a search for broader dental knowledge. He began to study with a view of remedying diseases of the teeth without the necessity of their extraction. For a number of years he gave only a portion of his time to dentistry, as he looked upon medicine as his real profession. He used the key with great skill and the forceps long before they were generally known or adopted. He died in 1843.

LEONARD KOECKER.

LEONARD KOECKER was born in Bremen, Germany, in 1785. While still a lad he became much interested in an itinerant Jew dentist and his instruments. Koecker was then engaged in mercantile business. He came to the United States in that capacity, in which he was successful, and about the year 1807 began the practice of dentistry in Philadelphia without any knowledge of, or special training for, its full responsibilities. He was possessed of exhaustless energy, inborn ability and quick perception, which, notwithstanding his great disadvantage at the outset, enabled him to build up a successful practice and a growing reputation. This was not without its financial

reward, as we are told that in that year his income from his practice amounted to \$8,000. Failing health caused him to take a voyage to Europe. He settled in London, where he remained in the practice of dentistry until his death in 1850. Here he built up an extensive practice and a world wide reputation, which even the men of the present day have not lost sight of. In 1826 his work on dental surgery was published at London and became a valued text book.

Eleazar Parmly describes Koecker's first dental operation in this way: "He grasped the tooth with an instrument, shut his eyes, and turning

J. PARKHURST, DENTIST,
 47 LIBERTY-STREET,

Performs every necessary operation on the teeth and gums, removing with care, fixed tartar, cleans, files and polishes teeth without injury to the enamel, and affixes in the best manner artificial teeth.

His confidence in his unrivalled mode of *extracting teeth* is undiminished; and he appeals to the *many* who have experienced the ease and safety with which he extracts broken, decayed, and stumps of teeth as the best evidence of this fact. He can take out stumps of teeth without injury to the gums, and generally without even touching them.

* * * Antiseptic vegetable American tooth powder, warranted efficacious and harmless, for sale.

J. Parkhurst has recently established an electrical machine which is capable of every requisite operation.

A.

1815.

his head from the patient made a strong effort to dislodge the tooth, he being meanwhile under such excitement that he knew not whether the tooth was out or the jaw broken."

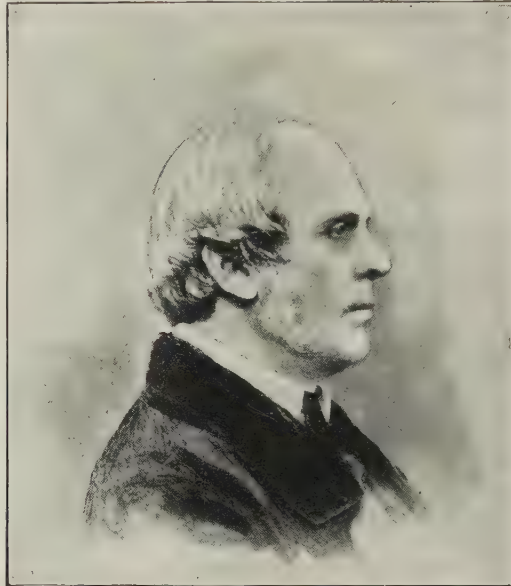
The patient, Parmly adds, gave assurance to the operator that he had never had a tooth extracted so easily, and from the influence of this case Koecker's success is said to have commenced.

CHAPIN A. HARRIS—JAMES TAYLOR.

All of these early dentists of note came from the Atlantic seaboard or foreign shores, but, in 1826, there lived at Bainbridge, Ohio, Dr. James Taylor and Dr. John Harris, and at Greenfield, Ohio, Dr. CHAPIN A. HARRIS. Dr.

Taylor studied medicine with Dr. John Harris, who also had a little knowledge of dentistry, which Taylor imbibed.

From an address delivered by Professor James Taylor before the Cincinnati Dental Association, in 1861, we learn that Chapin A. Harris was born on May 6, 1806, in Onondaga county, New York, and at about the age of seventeen he removed to Madison, Ohio, where his older brothers, James



Chapin A. Harris M.D., D.D.S.

and John, had previously settled. John practiced medicine and Chapin A. Harris entered his office as a student. The State of Ohio was then divided into a number of districts, in each of which a board of medical censors or examiners was created by law, whose duty it was to examine candidates for licenses to practice medicine. Without a license from this board, fees for medical services could not be collected. At that time medical education in the west had not progressed very far, and Dr. Taylor is authority for the statement that there was not one physician in ten who was graduated from a regular medical school, and dentistry at that time had neither school nor

examining boards to prepare the way or permit entrance into practice. Dr. Chapin A. Harris, having been licensed by this board, commenced the practice of medicine in Greenfield, Ohio. His brother, John, removed to Bainbridge, the native place of Professor Taylor, and where the latter became his student in medicine.

In the latter part of 1827, Dr. Chapin A. Harris began to give attention to the practice of dental surgery, and gathered around him several students, who joined him in the search for dental knowledge, of whom Dr. Taylor was one. From Greenfield, Dr. Harris removed to Bloomfield, Ohio, in 1828, and here practiced dentistry and medicine for two or three years. Thence he removed to Fredericksburg, Va., where he confined himself to the practice of dentistry only, the demand for his service being so great as to lead him to abandon entirely the general practice of medicine and surgery. From Fredericksburg he removed to Baltimore.

"Dr. John Harris and myself had many protracted discussions on the importance of a medico-dental education and the best method of securing it. In these we were joined by Dr. C. A. Harris on one or two occasions, or perhaps oftener. The leading idea, for several years, was to have a department of dental surgery attached to medical colleges. But the medical faculties had already too much to teach, and it was feared that while, by this course, all might be made dabblers in dental practice, but few would be made proficient in dental science. The more our specialty was looked into, the more important it appeared, and it soon became too large for annexation in that way.

"Professor Chapin A. Harris certainly is entitled to the credit of making the first movement in the right direction, and of establishing that system of instruction which alone can give character and stability to our profession. I am truly glad to see that this system gains more and more in favor, and I cannot see why any member of the profession should hold back, in regard to that which exalts and dignifies his own profession and himself."

We thus see that the Dental profession, as we now know it, was conceived in Ohio, although its parturition took place in Maryland, and its position afforded a field in which latent ability and the conception of a new profession found proper soil and conditions to develop into a living reality. When the mature thought and great experience and wisdom gained in the long years of labor of Horace Hayden became joined to the vigor, energy and capacity for work and unequalled devotion of Chapin A. Harris, then only about thirty years of age, a creative and constructive force was engendered

which resulted in the birth of the American profession of dentistry, first Dental School, first Dental Journal and first Dental Society. The establishment of the first school for the education of dentists; of the first periodical journal for the dissemination of knowledge and professional news to the men who were devoting themselves to the care of the human teeth; and the



DR. JAMES TAYLOR.

formation of the American Society of Dental Surgeons, in which the few widely scattered dentists of the day were brought together to be better enabled to work more effectively in the upbuilding of the new profession and to carry on a propaganda of education among the people, were undoubtedly the rocks of the foundation upon which these master minds started to build the beneficent calling of the dentist.

It would be difficult to say whether Harris or Hayden had the higher or stronger mind. It is certain that the ripe thought of the one united with the capacity for work of the other, and, operating in unison of purpose and execution, took the initiative that stimulated other high minded men to

join them in efforts that resulted in the development of what is now known as the dental profession of the United States. The influence of their activities, like a pebble thrown into the sea, kept on multiplying and increasing its circular ripples until its perpetuation became no longer visible because it had extended to the farthestmost shores. There has been no part of the civilized world in which the ripple caused by the pebbles thrown into the unexplored waters of dental possibilities by Chapin A. Harris and Horace Hayden and their associates have not been distinctly discernible.

DR. JAMES TAYLOR, who was closely allied with Chapin A. Harris in his earlier work of research of dental science, found it inconvenient to assist in the establishment of the college at Baltimore, and decided to establish his home and field for labors at Cincinnati. The germ for a dental college in the west was engendered in the mind of Dr. Taylor soon after Dr. Chapin A. Harris had decided to start the school at Baltimore, and he succeeded in establishing the Cincinnati College of Dental Surgery, in 1845; his coadjutors being Drs. John Allen, Melancthon Rogers and Jesse Cook. The Baltimore and the Cincinnati schools having been established and proven a success, other schools were organized in rapid succession in both the east and the west.

The subscription list of the American Journal of Dental Science in 1840 showed the following:

3 subscribers in Alabama	91 subscribers in New York
2 " in Arkansas	13 " in North Carolina
15 " in Connecticut	11 " in Ohio
6 " in the District of Columbia	34 " in Pennsylvania
11 " in Georgia	3 " in Rhode Island
2 " in Illinois	9 " in South Carolina
2 " in Indiana	5 " in Tennessee
16 " in Kentucky	30 " in Virginia
8 " in Louisiana	22 " in England
30 " in Maryland	2 " in France
15 " in Massachusetts	1 " in Holland
2 " in Missouri	1 " in New Brunswick
3 " in New Hampshire	4 " in Scotland
6 " in New Jersey	1 " in the West Indies.

In all there were 317 subscribers in the United States. This subscription list probably fairly represents the members of the thinking, real and progressive dental profession of that day.

The numerical strength of the dental profession in the United States in

1839 may be estimated from the fact that the "Journal" had 178 subscribers. The territory in which these practiced extended as far as Jacksonville and Springfield, Ill. In the former place was C. Clark, and in the latter James Clark. These were the only Illinois subscribers. B. B. Brown of St. Louis was located the farthest west. There seems to have been no dentist then at the village of Chicago, if judged by this subscription list, who took an interest in dental journals.

THE PACIFIC COAST.

On the Pacific coast the first dental practitioner is said to have been Dr. George Wellington, who was a member of the Hudson Bay mission to the Columbia river that founded Fort Vancouver, in 1824. A French dentist named Talliaferro visited Fort Vancouver, and, in 1836, he and Dr. Wellington returned to Europe. No further record of a dentist on that coast is known until about 1844, when W. Dunning of New York visited Astoria at the mouth of the Columbia River. He was a few years later succeeded by Dr. Adams, who came from New Orleans, and is said to have practiced also in the coast towns of Central America and Mexico. When the gold discoveries of California caused a migratory wave thither, a number of dentists visited California, among whom was Dr. Buchner, who is said to have been among the first to practice in California.

EARLY CHICAGO DENTISTS.

According to Andreas' History of Chicago, "Dr. William H. Kennicott began practicing dentistry at the Eagle Tavern in Chicago, Ill., on March 25, 1834. He seems to have had the field entirely to himself for some time, but in a copy of the "Chicago Express," published October 21, 1842, these advertisements are printed, which we feel warranted in reproducing as they represent fairly, no doubt, the education of the public with reference to dentistry, as well as the progress made by the practitioners of that profession at that time. We of today may look upon these announcements as unethical, but the conditions of those days probably required that a dentist should inform the people through the public press just what sort of an individual a dentist was.

TEETH! TEETH! TEETH!

Dental Operations by Dr. E. Judson.
98 Lake St. over S. W. Goss & Co.'s Store.

Silicions, Metallic Teeth, inserted, from one to a set, so as to imitate nature in every respect. These teeth do not absorb the juice of the mouth, are incorruptible in their structure, and can in all cases be inserted so as not to produce a fetid breath. Decayed teeth restored to health by plugging with gold and rendered less likely to decay than those still remaining sound. Tender teeth filled with lithodeon, also any other operations necessary to the preservation of the teeth. The changing of children's teeth will be managed so as to prevent irregularities, and the most difficult cases of irregularities remedied if applied to in season.

N. B. The neglect of the teeth is the cause of much suffering and regret, and should not be disregarded by the most thoughtless. All who have the advantage of judicious dental operations readily acknowledge this one of the most useful sciences of the day. Hours for operating 7:00 A. M. to 5-½ P. M. When not in the office, please call at my residence on State Street.

DRS. KENNICOTT & BRADLEY, SURGEON DENTISTS.

Doct. Bradley, recently from New York, has formed a connection with Doct. Kennicott in the practice of dentistry in this City and the surrounding country. By this arrangement the citizens of Chicago will be able to avail themselves of the well-established skill of Doct. Bradley during the absence of Doct. Kennicott to the country, and will at all times secure the constant attention of one or the other at the office. Of Doct. Kennicott, the public need not be further apprised, as he has for the last eight years faithfully, as he trusts, and successfully served in the line of his profession.

Every article of the profession constantly on hand. Office on Clark Street over the Land Agency office of J. B. F. Russell near the Post Office, Chicago, October 24, 1842.

The same paper contains still another advertisement reading as follows:

DENTISTRY.

Dr. Kennicott has removed his office opposite the Post Office where he will receive the professional visits of ladies and gentlemen from 8:00 o'clock A. M. until 6:00 o'clock P. M. or by appointment, if requested, will perform operations at their residence. Dr. K. returns his sincere thanks for the liberal patronage of this community during the last eight years, and promises unremitted attention in future with every improvement in the profession. Dr. K. professes to restore the teeth to health and usefulness at all stages of decay, even where the nerves and blood vessels are wholly exposed and with little or no pain. He will keep on hand a large supply of the most approved, incorruptible teeth, with all others now in use, which he will insert from one to an entire set at the shortest notice, and in the most useful and durable manner.

N. B. Doct. K. warrants his work as he ever has done, and is willing to make all reasonable repairs free of charge. October 24, 1842.

DR. WILLIAM H. KENNICOTT.

Dr. William H. Kennicott was born in Western New York, in 1806. He removed to New Orleans and Natchez, in 1822, and came to Chicago in 1834, and must have gathered his dental knowledge while he lived in the southern cities.

Kennicott became a man of considerable importance in early Chicago.



DR. WILLIAM H. KENNICOTT.

In the Spring of 1848, when the water supply of the young city was largely mixed with shoals of little fishes, he was made one of a committee of three to suggest a better plan of getting water from the Lake, which resulted in pipes of wood being laid a distance out into the Lake, and three feet under ground, in the City, the water being taken from a depth of twenty feet in the Lake, a perpendicular pipe being so placed as to take the water from ten feet above the bottom. He remained in practice until October, 1863, when he died of apoplexy at his country home near Chicago.

REMINISCENCES OF EARLY DENTAL SCIENCE.

Dr. Curtis S. Chittenden of Hamilton, Ontario, published his reminiscences of fifty years ago in the "British Journal of Dental Sciences" in 1886. As a boy ten years of age he visited Burlington, Vt., in company with his father, and noticed in a door plate of a house, "O. H. Saxton, Dentist." He asked his father what that meant, and learned that a dentist was a man who treats people's teeth, and that it was a very lucrative business. Two years later, in 1837, he visited an older brother at Nunda, N. Y., who was a dentist, and whom he saw using teeth made out of calves' teeth as substitutes in the mouths of his patients—and who also inserted teeth carved from a hippopotamus tusk—by means of gold wires fastened around the natural teeth. His brother showed his father some mineral teeth which he thought might possibly supplant those made from the teeth of animals.

In 1846, upon the advice of his brother, he took up the study of dentistry with him. The studying consisted of watching the manipulations in the operating room and laboratory, with such explanations as his brother might be disposed to give him. The only book that was available for study was one of the original editions of "Harris' Practice." The equipment of the dental office was exceedingly meagre. A lathe was superfluous in those days. Teeth were ground upon a small grinding stone like that used for the sharpening of knives, and the polishing of plates was done by hand with pencils and sticks dipped in oil and emery.

Dr. Chittenden informs us that when Dr. S. P. Hullihen of Wheeling, Va., presented his system for treating exposed pulps, it was named "Rhizodontology." He also tells us that Dr. S. P. Miller of Worcester, Mass., discovered or invented this identical operation, which in Boston they called "neurhamaxis." While Dr. Hullihen "rhizodontologyed," Dr. Miller "neurhamaxied" nerves for a year or two, and there was a lively war between the friends of Hullihen and the partisans of Miller.

This probably was one of the causes that many years later produced the establishment and introduction of national dental nomenclature.

DENTAL FEES.

The fee in country towns for an upper or lower set on gold was \$50.00; on silver half of the same, for filling with gold, 75 cents, and for tin, 37½ cents. In the larger cities higher fees were charged.

In 1874 the Dental Cosmos published a letter from Dr. George H. Chance

of Salem, Oregon, in which he relates a call upon James Parkinson, dentist, 36 Sackville street, London, who showed him an advertisement which appeared in the "Stationers' Hall Sheet Almanack," published in 1709 during the reign of Queen Anne, and also some dental ledger entries which indicate the fees which dentists in England received a hundred and twenty year ago. The advertisement read:

Sets of Teeth set in so well as to Eat withal, and worn years together undiscovered. Also Teeth Cleaned and Drawn by John Watts, operator in Raquet Court, Fleet Street, He applying himself wholly to that Business.

	L.	s.	d.
Jan. 29th 1 tooth leaded		10	6
Feb. 1st 1 tooth leaded		10	6
" 16th 1 tooth stopped, gold	1	1	0
" 16th 2 teeth leaded	1	1	0
" 21st 1 tooth leaded		10	6
" 30th New pivot	1	1	0
July 6th 2 teeth stopped with gold.....	2	2	0
" 7th 9 teeth on plate	10	10	0
" 7th 2 teeth leaded	1	1	0
" 14th 2 teeth replaced	2	2	0
" 15th 2 teeth filled with gold.....	2	2	0
" 30th 1 tooth filled with gold.....	1	1	0
" 30th 2 teeth stopped	1	1	0
Aug. 3rd 2 teeth stopped with gold.....	2	2	0
" 10th New gold pivot to natural tooth and roots filled with gold.....	2	2	0
" 19th 2 teeth leaded			
" 24th 8 teeth on frame	9	9	0
" 29th 1 tooth leaded		10	6
" 31st Gold wire on front tooth.....			
Sep. 8th Whole set complete.....	21	0	0
" 19th Lady Harriet Hay 1 hour's trouble...	1	1	0
" 24th Lady Godolphin 2 teeth drawn.....	2	2	0
Oct. 19th Lower set complete.....	10	10	0
Nov. 3rd 3 pivot teeth.....	6	6	0

John Watts was the predecessor of Mr. Parkinson's grandfather. The entries copied are selected from his ledger of 1789, in which year the gross receipts of the business were £2,886, 3s., 6d.

THE RELATIONS OF DENTISTRY TO MEDICINE.

The leaders of medical thought and the gentlemen who were responsible for the conduct of medical schools, it is presumed, watched the formation and development of the first dental schools of this country with con-

siderable complacent humor. While there were always broad-minded men in the medical profession who, like Hunter, realized and taught that there was nothing connected with the health and comfort of mankind, too unimportant or too insignificant for the care and attention of the medical man and teacher, it is unquestionably true that for many years the medical pro-



NORMAN W. KINGSLEY, D. D. S.

fession, as a whole, looked upon dentists, or the dental profession, very much in the same way that, a hundred years or more previously, the physician viewed the surgeon, and the surgeon the barber surgeon; but it is equally true that the dental profession, or the dentists, did not imitate the barber-surgeon and the surgeon in their contemptuous treatment of the physicians. The relations between medical men and dentists from the broad professional standpoint have always remained in an undefined and unsettled condition. The question whether dentistry is a profession by itself or a department or specialty of the medical profession has frequently been discussed by individuals, by societies and by the journals devoted exclusively to dentistry or

to medicine. Long controversies, sometimes satirical, sometimes humorous, have been indulged in on both sides of the proposition. There has never been a court of competent jurisdiction to render a final decision in the case, and so dentistry has grown up with its own special schools, its own special investigators, discoverers and inventors, its own extensive literature and journalism, into an independent branch of the healing art, not only without the assistance of the medical profession, but many times against the opposition of its members. It is not to be wondered that under these conditions the relations between dentists and physicians at the present time are different from those between physicians and the ophthalmologist, the aurist, the gynecologist and other men practicing specialties of the healing art whose training has been entirely gained under the instruction and by the aid of purely medically educated men.

The pages of the "Medical Record" in the latter part of October, 1886, contain a very elaborate exposition of the relations of dentistry to medicine presented by W. A. Purrington, Esq., for the medical side of the question, and by Dr. Norman W. Kingsley, President of the New York State Dental Society, for the other view. Dr. Kingsley controverts the position taken by Mr. Purrington in his review of the statutes of the state of New York relating to the practice of medicine, by showing that he wishes to correct a somewhat prevalent erroneous impression, namely, that dentistry is a specialty of medicine, and "the term dentistry covers every branch and department known under that name, and a dentist, in the full sense of the term in the present stage of the art, is one who understands and can practice it and every specialty of it."

"A dentist may be an oral surgeon," Dr. Kingsley continued, "but an oral surgeon is not a dentist. A dentist may be an excellent anatomist, physiologist, chemist, microscopist, artist or mechanic, but no one of these makes him a dentist.

"Oral surgery, even in its most comprehensive sense, is not dentistry; no more than dentistry in its most comprehensive sense is not oral surgery. I, therefore, affirm that dentistry is not a specialty of any other science or art, but is a profession of itself, as separate and distinct from all others as any other calling or vocation is distinct from every other.

"Dentistry is a profession because it is a vocation of beneficence. This is so patent that I need not attempt to prove it. Millions are on the earth today who call us blessed, because of the comfort we have given them and the benefit they have derived from us.

"Dentistry is a profession by universal acknowledgment. It has been an organized science for more than a generation, and has been called a 'profession' by common consent by the cultured and uncultured, as well as by its own practitioners.

"Even the highest authorities in medical literature refer to dentistry, not as the 'dental specialty of medicine,' but as a 'profession.'

"The designation of it as a 'profession' is not an assumption like that of a barber, the dancing-master, or the itinerant phrenologist; it is entitled to the distinction because the mastery of it as a science or an art involves a considerable knowledge of many other sciences.

"Its resources are not only nearly all the sciences, but in an equal degree nearly all the arts. Hardly an art from plumbing to sculpture, but has its prototype in some branch of dentistry, and yet it is not a department or a specialty of any one of them.

"While a large part of its processes are of a mechanical nature, it is not a mechanical trade, inasmuch as a mechanical trade is governed by fixed rules and a routine of labor, in which each workman is a servile imitator of the pattern given him, and can become master of his trade without any knowledge beyond its details.

"The methods of the painter and sculptor are the methods of the mechanic, but portrait, figure and landscape painting and sculpture are branches of fine art, and the vocation is a profession, not a trade. That which dignifies the practice of dentistry, bringing it above ordinary mechanics, is the fact that the operations are performed upon living organisms; and that which makes it professional is the knowledge of anatomy, pathology, etc., which discriminates in directing the mechanical treatment. Dentistry is not a specialty of medicine, because its chief and predominating characteristics are utterly unlike anything which is taught in medicine, requiring for their successful performance natural faculties and requirements that are entirely distinct from the practice of medicine. That which makes dentistry as a science kindred to medicine as a science, is the fact that it deals with a small, but important, part of the human economy. But the equally great fact that its methods are entirely distinct, requiring special education and special training, makes it an independent science and in no sense subordinate to the other. Dentistry became an independent profession, not through any spirit of rebellion against the medical profession, but from sheer necessity. The fathers of dentistry in this country were graduates of medicine, and hoped to dignify their vocation by grafting it upon medicine, and

have the theory and practice taught in medical schools. Their application was refused, and the history of dentistry as an independent, progressive and scientific organization began, and today the wondrous fact is the astonishment and admiration of the scientific world. * * * Those universities which teach dentistry, teach it as a separate department from medicine and confer a distinct degree. We have an independent literature, which is not indebted to medicine so much as it is to other sciences. Anatomy, physiology, histology, microscopy, chemistry, etc., are not medical studies. They are sciences, upon which medical and other studies are based."

Mr. Purrington uses great erudition and satire in controverting the position taken by Dr. Kingsley, and concludes thus:

"Just as far as dentistry is not a purely mechanical handicraft, it is a branch of medicine. As long as the surgeon was only a blacksmith with a searing iron, as long as the barber surgeon mechanically applied a bandage, a cup, or a leech, and nothing more, they were tradesmen; that is to say mechanics or artificers, whose livelihood depends upon the labor of their hands, and not professional men, that is to say, men deriving their livelihood from the application of abstract knowledge and reasoning thereon to the concrete affairs of life.

"The fact that its operations are performed on living organisms does not, per se, dignify the dentist's calling over that of the chiropodist, manicure, masseur or barber, any more than the fact that its operations are performed on inorganic matter belittles the profession of a civil engineer. Nor does the fact that the extraction, filling and imitation of teeth are carried on chiefly as mechanical operations, affect the truth of my statement, excepted to by President Kingsley, that when the dentists ceasing to be mechanics, undertake the treatment of diseases of the mouth, they become practitioners of medicine and surgery.

"On my part I admit that the dentist's calling is so largely mechanical in its processes that, just as was that of the surgeon in times past, it has been denied by some to form part of the medical profession. * * * In Michigan the taxation of a dentist's instruments as mechanics' tools was upheld, and the court said that a dentist, in one sense, is a professional man, in another his calling is mainly mechanical, and the tools which he employs are used in mechanical operations. In Mississippi a contrary view was taken, the court saying: "A dentist cannot be properly denominated a mechanic. It is true that the practice of his art requires the use of instruments, * * * but it also involves a knowledge of the physiology

of the teeth, which cannot be acquired but by a proper course of study, and this is taught by learned treatises on the subject, and as a distinct, though limited, part of the medical art. * * * If such persons should be included in the denomination of mechanics, because their pursuit required the use of mechanical instruments, * * * the same reason would include general surgeons under the same denomination." * * *

The argument in favor of constituting dentistry a part of medicine is thus concluded.

"The function of dentistry being as yet chiefly mechanical, and carried on in well defined limits, dentists have been expressly exempted from purview in all the bills introduced by the Medical Society of the State of New York, and it will be the questions arising in civil cases, chiefly for those damages resulting from bad work and advice, and not criminal actions, that will eventually settle in what degree the dentist is to be regarded as a professional man."

This difference remaining an open question it resulted in the formation of an Inter-National Dental Congress. The International Medical Congress, although it has a section on stomatology, does not admit the holders of the degree of D. D. S. to its deliberations as members.

EARLY FATHERS OF DENTISTRY IN VARIOUS PARTS OF THE WORLD.

While the writer has confined his observations of the record and times of the first forty years of the nineteenth century largely to the United States, and only to a few men of that period, it was not in his mind to convey the idea that there were not others here who also became prominent in the upbuilding of the dental art and science in this country. Neither did he wish to create the belief that all of the improvements in dentistry up to what may be called modern days were due to Americans, as it is undoubtedly true that the greater portion of the scientific research into the mysteries of the underlying sciences was largely developed by the French, German, English and other continental investigators in these fields. Dentistry was developed on American soil as an independent profession. It may be safely asserted, that the condition of society here, social, professional and political, and the newness of the country, which left it untrammelled by the embarrassments of long established precedents existing in Europe, probably contributed in a large degree to make the United States the especially adapted field for the battle of creative development of the dental profession.

Liberty and independence had been the battle cry of the people in other matters, and it is, therefore, not strange that liberty in experimentation, accompanied sometimes by empiric daring, should have led men, and associations of men, to establish an independence in thought, investigation and action.

To the fathers of dentistry whom we have already mentioned in the United States might be added a galaxy of other names such as Charles Hayden, Edward Maynard and James S. Gunnell, of Washington, D. C.; F. H. Clark, Oliver Holmes and Enoch Noyes, of Baltimore; D. Monafeldt, J. A. Cleveland and B. A. Rodriguez, of Charleston, S. C.; Samuel Avery and L. S. Parmly of New Orleans, La.; Ludolph Parmly, of Mobile, Ala.; J. D. McCabe and F. B. Chewning, of Richmond, Va.; Drs. Fisher and Sumner of Providence, R. I.; W. B. Scott, of Raleigh, N. C.; O. P. Laird, of Columbus, Ga.; Elbridge Bacon, Daniel Harwood, Joshua Tucker, Dr. Greenwood and Solomon Keep, of Boston, Mass.; S. P. Miller, of Worcester, Mass.; Jahial Parmly and A. B. Hayden, of Savannah, Ga.; M. K. Bridges, of Brooklyn, N. Y.; Eleazar Parmly, Elisha Baker, John Lovejoy, Joseph N. Foster, J. Smith Dodge and Solyman Brown, of New York; H. N. Fenn, of Rochester, N. Y.; S. Blanding, of Columbia, S. C.; Edward Taylor, of Maysville, Ky.; Vernon Cuyler, of Hartford, Conn.; Elisha Townsend, J. McIlhany, Lewis Roper, Daniel Harrington and E. B. Gardette, of Philadelphia.

At the same time there labored in Europe, Robert Nasmyth and David Wemyss Jobson, of Edinburg; Samuel Cartwright, Alexander Nasmyth, John T. Edmonds and Thomas Bell, of London; James McPherson, of Glasgow; G. S. Brewster, C. F. Delabarre and Mons. Le Maire, of Paris; A. G. Becht, of The Hague; E. Gidney, of Manchester, England, and many others.

To these were added in Europe about that time and since such investigators as Leber and Rottenstein and Carl Wedl in Germany and Austria; John Tomes in England; Magitot in France, and many others whom there is not room to name in detail in this place. We cannot, however, close this chapter without calling attention to the fact that shortly after the institution of the first two dental colleges in the United States, John Tomes instituted a course of lectures on dental physiology and surgery at Middlesex Hospital School of Medicine, which lectures were published in book form in 1848. They were first delivered in 1845, and their publication in serial form commenced in that year and was completed in 1847.

JOHN TOMES.

In his preface Mr. Tomes says:

"When I had the honor to accept the office of dentist to the Middlesex hospital, I promised the medical officers that, should it be thought desirable, I would deliver a course of lectures on dental physiology and surgery at the medical school attached to that institution. * * *

"These lectures were written for and delivered to beginners. They were not, and they are now, addressed to those already conversant with the subjects of dental physiology and surgery. * * * The lectures were not written for those who had learned, but for those who had yet to learn."

In the first words of his first lecture Mr. Tomes uses these words:

"In a benevolent institution, like the Middlesex hospital, made to fulfill the double purpose of providing medical aid for the indigent in their times of sickness, and of affording instruction to those engaged in the study of medicine, it became the duty of all who treat disease, whether grave or trivial, whether mental or bodily, to explain, to those of you who are pupils, the principles on which their treatment is based; and it is equally, too, your duty to avail yourselves of every opportunity to acquire that professional knowledge, in the practice of which your future years will be spent; honorably, if you have knowledge, dishonorably, if you have not. Hence, it devolves on me, in virtue of my office as dentist, to describe, and on you, in your pupilage, to learn, the nature of the diseases to which the teeth are subject, and the principles on which they may be most successfully treated."

In England, and in Continental Europe, the education of men for the practice of dentistry in its scientific side was fostered and controlled in the beginning by educators in the medical institutions. It is, therefore, not to be wondered at that greater attention was given in these countries to investigations and discoveries in the fields of the underlying sciences that largely obtain to theory; while under the circumstances in which dentistry was born and developed during our period of active experiment and quick application of results to utilitarian uses in all vocations of life, dentistry should have caught the impetus of the spirit of the times, and that thus its practical side, and discoveries and investigations to facilitate this, was greatly stimulated and encouraged. It made such progress as to give American dentistry preeminence throughout the world in operative skill and daring, prosthetic excellence, and in the materials, instruments and appliances possessed of especial adaptability, that necessity caused the inventive genius of

practitioners to design, the skilled hand of the manufacturer to produce and the commercial enterprise of the legion of dental dealers to supply.

NOMENCLATURE.

A profession has a common interest in the thought, aspiration and purpose of action of all of its members; it forms a solidarity which should be unrestrained by geographical boundaries or differences of vernacular. It requires a language, terms belonging peculiarly to itself, that shall be understood by all of its members and shall convey the same meaning to them wherever they may be situated, or to whatever nation they may owe political allegiance. Science and art belong to no race, no clime, no country. The evolutions made by science, applied and turned into use by art, are the heritage of the entire human family.

To have a language or words that apply particularly to the ideas, or things belonging exclusively to the dental profession, which shall convey their meaning accurately to those to whom dental thought and dental practices are particularly a concern, is a great conception. Great honor is due dentists of the United States who many years ago agitated and considered this question. They built a strong foundation upon which names of discoveries, new methods of practice and new inventions, can be, from time to time, added and clearly expressed, upon a system of nomenclature evolved in this country.

The need for uniform words to express the same idea, or to describe the same subject or thing, began to be apparent to the dental profession about fifty years ago. The birth and expansion of a special literature demonstrated the paucity existing in a special vocabulary. This want or deficiency became particularly noticeable when dentists from various sections of our country, and from different lands, intermingled and debated in professional gatherings. The diversity of expressions or words used in the attempt to convey the same thought or describe the same thing in our journalistic literature, was so confusing that a desire to establish a professional nomenclature sprang into existence.

In 1864, in an article on "Dental Nomenclature," Dr. L. G. Ingersoll of Keokuk, Iowa, uses these words:

"In the development of science new words and technical words are a necessity for obvious reasons, but the greatest caution is needed in introducing them, so as neither to obscure the meaning, nor convey a wrong meaning. In our dental nomenclature we have words full of appropriate expressive-

ness. * * * But whoever perceived any appropriateness in calling that portion of a tooth sunk in the alveolus and covered by the gum, a 'fang'?

* * * It is proper to call the tusks of a wild boar or wolf, or the poisonous teeth of a serpent 'fangs'. The term *root* is certainly not inappropriate in its signification, for like the root of a tree it is both a functional and physical support. Like the root of a tree or plant, it is covered and excluded from external influence, but holds vital relationship with the parts immediately surrounding and in contact with it. It is like the root of a tree in supporting the body of the tooth in firm position against the power of mastication, which tends to topple over or dislodge it. With much greater propriety might we call the instruments with which the root of the tooth is extracted, 'fangs'. * * * Not *fang forceps*, but *fanged forceps*."

In 1879 Dr. Jonathan Taft published an article on "Dental Nomenclature and Terminology," in which he says:

"The modifications of words should not be left subject to the whims and caprices of the pedant and charlatan. All words, and especially the names and terms, should be defined and established on such a basis as will give them the greatest range of usefulness and the most enduring stability. The misuse of words produces confused thought and ideas, and impairs the value of language as a medium of communication. In medical literature a large proportion of the distinctive names are taken unchanged from other languages, generally from the Greek and Latin—definite languages so far as the form and construction are concerned—sometimes falsely called "dead languages."

"In the "Cosmos" of 1880, a letter by Dr. Robert Arthur, of Baltimore, concludes with these words:

"In scientific statements of descriptions, precision or exactness is of the very first importance."

W. Finley Thompson, of London, in 1881, so far as is shown by the literature of the profession, was the first to systematize and place in tabular form the names of carious cavities.

In the session of the American Dental Association, held in 1881, Dr. Buckingham called attention to the lack of a proper dental nomenclature, and to the fact that a speaker recently, at a meeting of the New York Odontological Society, had described secondary dentin as one thing, another described a different condition which he also called secondary dentin, and still another described a third proposition as secondary dentin. He urged

that the section on nomenclature should give authoritative definitions of such matters.

At the meeting of this association held in 1883, the committee on nomenclature reported that the propriety of anglicizing distinctive names in literature derived from the Greek and Latin was a question upon which there was a diversity of opinion. The report contained these words:

"The rendering more plain and understandable these distinctive names and phrases would seem to be very desirable; inasmuch as a large majority of those engaged in the study of the branches in which they so greatly abound, have but little or no knowledge of any other language than English."

In introducing new words or phrases where necessity may demand, this report suggests that "caution should be exercised; every new word, name or phrase introduced should be made clear and comprehensive to every reader, before it is generally employed. Its origin and signification should be such as to commend it to the judgment of every one of general culture. * * *

The first permanent molar is often called the 'six-year molar' and sometimes, the 'six-year old molar,' the latter being a crude expression that no one of just taste would tolerate for a moment. * * *

Some think the third molar is entitled to the Latin name, 'dentes-sapientiae;' and others are content with the English name 'wisdom tooth.' The better and more distinctive name is the third molar. * * *

"It is proposed here to bring before the association the terms 'mesial' and 'distal' in order to get a true definition and the proper use of these terms."

The use of the term "dentos" as a substitute for "dentin," as representing that part of the tooth constituting its body, which is enclosed by the enamel and the cement, is discouraged. But the word "dentos" is recommended as suitable to represent the body covering of the dentin of the tooth, generally called the cement or cementum. Speaking of the *nerve* of a tooth where the tooth pulp is meant, is pointed out as an error that should be corrected. The report discourages the substitution of the word "periodontium" for "periosteum," but suggests that the phrase "dental periosteum" may be used to distinctively designate the periosteum which covers the root of every tooth; and it further suggests the use of "periostitis" rather than "periodontitis."

The words "mechanical dentistry," to designate the manufacture and insertion of artificial teeth and all that pertains to it, are excepted to because of their insufficiency in distinctiveness. The report says: "Some may execute well the mechanical aspect, and yet signally fail in the production and application of substitutes for lost teeth and the restoration of adjacent parts.

A name that will embrace both these ideas is 'dental-prosthesis.' Some have changed the form of the phrase to 'prosthetic dentistry.' The other is the better phrase, we think. * * *

"It will probably be used ere long to the exclusion of the term 'mechanical dentistry,'" is a prophesy that may now be looked upon as fulfilled, at least in this country.

The word "operative-dentistry" suggests operations upon the natural teeth for their preservation. The attempt to embrace all operations, whether done upon the hard or soft tissues of the mouth, in the name of "oral surgery," is not concurred in. It was suggested that "oral surgery" may well be applied to all operations of the soft and hard parts in and immediately about the mouth, but that the nature of the operations upon the teeth entitles them to a distinctive name. The committee's report closes with this remark:

"The great difficulty that lies in the way of changes such as are suggested is found not so much in the question whether they are correct or not, as in the carelessness and want of attention by those who should be interested to make progress and secure the best form of distinctive literature."

Dr. C. E. Francis, in an article published in the "Dental Register," of 1883, on "Nomenclature," says:

"Refinement, culture and well-stored intellect are requirements of great value to even those who are endowed with natural mechanical tact.

"The common practice of applying the term 'nerve' to dentinal pulp, is a senseless misnomer. Aside from correctness of expression, it is certainly more euphonious to say the 'superior first molar' than the 'upper six year old molar.' It is easier to say 'superior cuspid' than 'upper eye-tooth.'"

In the "Dental Cosmos" of 1885 is a paper by Dr. W. O. Kulp, of Davenport, Iowa, upon "Nomenclature," or rather the lack of a systematic nomenclature. In this he explains a system adopted by him while teaching operative dentistry, which proved very satisfactory to him, and very effective and satisfactory to the majority of the students. The report, which can be found on page 597 of the "Cosmos" for that year, gives the names of the teeth, their surfaces and divisions of surface. It is the first recorded attempt at systematizing names in dentistry, but very limited in its extent.

In the discussion of this paper Dr. Taft said that the nominations suggested by Dr. Kulp were more definite than had been offered previously, and that although some of the terms had been used before, they had never been systematized as in this paper. Dr. Taft suggested that for the purpose of

avoiding tautology, it would be well to have synonyms, and that for "occluding" surface the word "masticating" might be interchangeable.

Dr. W. N. Morrison, of St. Louis, directed attention to the fact that Dr. Homer Judd, of St. Louis, and Dr. M. S. Dean, of Chicago, in a monograph on "Terminology," established the use of the words "mesial" and "distal," which had been extensively employed in St. Louis and Chicago.

A committee on dental nomenclature of the International Dental Congress held during the World's Columbian Exposition at Chicago, in 1893, to whom it was suggested that "they should present a plan by which a universal system of nomenclature may be adopted that would be acceptable to the profession of the entire world," made a very comprehensive report, which was adopted. Theirs was not a light task. The work accomplished by this committee, under the chairmanship of Dr. G. V. Black, deserves a prominent place among the tablets that mark the professional growth of the dentists' vocation.

The dental profession has thus laid its foundation for the establishment of a universal language in the expressions and names of things peculiarly applying to it. In this report occurs the following:

"The same author has habitually used several names applied to the same thing to the utter confusion of any but widely read and skillful readers. Some time ago, while reading a journal in the French language, your reporter found five distinct names applied to the same thing in a single paragraph of eighteen lines. This evil is not confined to one language, the same thing occurs in the English and in the German. In general literature it may often be recorded as in good taste to vary the expression used when dealing with matters of sense and the finer expression of sense impressions, or in the scenic descriptions. But in science or scientific writing, where execution is the chief end sought, a single name for a single object should be the rule. It is the function of legislation upon the subject of nomenclature to confine a single name to a single thing, and to induce every person writing of that thing to use that name only."

The scheme suggested was:

First: The plan of nomenclature shall be the same in the several languages.

Second: Use words derived from the Latin or Greek whenever such words are available; making use of the root, and giving it such prominence as may be suited to the language in which it is employed.

Third: When for any purpose a word from the Latin or Greek is not available, agree upon a word from another language and use in the same way.

Fourth: When it is impracticable to use the same word in the several languages,

select a word from each vernacular language, which should be as nearly exactly translatable as possible.

Fifth: Adopt such general and specific rules employed in the other sciences as may be adapted to dental nomenclature.

Sixth: Create such specific rules for the naming of things discovered in the future as will secure their universal use and prevent the duplication of terms.

Seventh: Make rules for translation of names arising in one language which, from form or other reasons cannot be used in some other language.

In this same congress Dr. Garrett Newkirk, then of Chicago, presented a paper devoted exclusively to the nomenclature relating to forms of the dental arch and special positions of the teeth.

In 1895 a report on nomenclature was made to the American Dental Association by Dr. S. H. Guilford, of Philadelphia. In this, stress is laid upon the fact that a new art or science develops more rapidly than it is possible to coin words with which the ideas developed can be properly and correctly expressed. The committee suggested:

"Terms that are scientifically incorrect should be discarded at once and correct ones substituted. Those that are not absolutely incorrect may be tolerated for a while longer, but for the new ones which must necessarily be introduced from time to time, this association should establish a standard or code, and use its great influence in securing its approval and adoption by the profession in this country at least."

The desirability for a system of nomenclature which should be international in its character, was accentuated, but it was urged that at present an attempt to accomplish this would not be well timed, but that if a system could be devised and adopted for this country that should be based scientifically and meet our wants, that such a system would eventually become the vogue everywhere. The committee called attention to the difficulty of framing a satisfactory code in nomenclature by the use of any living language, as these are constantly undergoing changes and are not universally understood; and they concluded for this reason that the Latin or Greek languages alone are available for this purpose, as these are finished.

The committee commended the nomenclature in descriptive anatomy of the teeth suggested by Dr. Black, but intimated that some modifications of that plan might be necessary later; and that inasmuch as the four surfaces of the crown of a tooth in this terminology end in "al," a word with the same ending for the fifth, or antagonizing surface, should be adopted. "Whether this shall be 'occlusal' for the bicuspid and molars, and 'incisal' for the incisors, as suggested by Dr. Black, or 'morsal' for all, as proposed

by Dr. Kirk, remains to be determined." The committee favored the use of the simple word "occlusal" to designate this surface of all of the teeth. They also recommend that the choice between the words "gingival" and "cervical" should be given to the latter, because "it is exact in its meaning and has the sanction of long use." Former recommendations that the molars be designated as first, second and third, respectively, and that the word "cuspid" is preferable to "canine" as indicating the single cusp tooth, while the word "bicuspid" designates their neighbors with two cusps, were rendered. In indicating a particular tooth, a methodical manner was recommended. First, the jaw, then the side, and lastly the tooth should be referred to as, "superior, left, second molar."

It was also recommended that the final vowel "e" in dentin, iodin, etc., be dropped.

At the same time Dr. Grant Molyneaux, of Cincinnati, reported with reference to prosthesis. The distinction between a cast and a model, words which had generally been interchangeable as synonyms, was made clear, "a model" being defined as something that is to be imitated or reproduced in metal. A "plaster-cast" is a fac-simile of a mouth, upon which a denture is to be molded. To use "vulcanite" and "rubber" as synonyms was decided to be improper, and "vulcanite" the term to be preferred.

In the metallurgical department the terms "white metal," "platinized silver" and "platinized gold," when referring to gold alloyed with platinum, sometimes called "clasp metal" and "spring metal," were also considered. The combination of platinum and gold generally known as "clasp metal" would be called "platinous gold," but if it is necessary to increase the quantity of platinum in an alloy, it would then be called "platinic" alloy; and additional compounds being added, the prefixes "hyper" and "hypo" could be used, so that the designation of the compounds may also be definite in term.

It was recommended that in the word "aluminium" the last "i" be dropped in keeping with a rule which has governed in metallurgy for more than fifty years, which established the use of the extra "i" only in very rare metals.

Dr. Black's suggestion to substitute the word "occluding frame" for the word "articulator" was not sustained in this report, but it was recommended to adhere to the latter word because of its long usage, because it was a single word, and because the word was more suggestive of the operation to be performed. The words "prosthesis" and "prothesis" having been used as

synonyms, the committee adopted the word "prosthesis" as being more properly applicable.

Dr. A. H. Thompson, of Topeka, Kan., referred to the admirable study and resume of this subject furnished by Dr. Black and pronounced it "a landmark in the history of dental nomenclature, and as a proper starting-point for a new departure." He argued that the progress in this direction should be made through the instrumentality of the American Dental Association, as a decision emanating from this body would command the respect of the profession, and would gradually become the standard.

In 1896 the committee on nomenclature of the American Dental Association, through its chairman, Dr. Guilford, presented a further report which had reference to correct pronunciation and phonetic spelling, and was also devoted to definition of many words used in special branches of dental science and practice.

Dr. G. V. Black, before the National School of Dental Technics at its meeting in 1897, read a paper devoted to nomenclature with reference to instrumentation. In this he stated:

"It cannot be expected that this proposed scheme for classification and study of instruments will be of special benefit to dentists now in practice. That is not its object. It is intended for school work only, but may in time spread to the general profession through the students who go out from our schools."

This nomenclature of instruments and instrumentation is now in use in many of the dental schools.

Dr. Ruggles, of Portsmouth, Ohio, at the meeting of the Ohio State Dental Society in December, 1898, in a paper on dental nomenclature, observes:

"The history of dental nomenclature is much the same as that of other sciences. Simple in the beginning, it gradually became more complex as advancement was made. * * * Nomenclature is the product of a few individuals working along the lines in which they are most interested, and as new writers enter the field, new words are coined."

He explained and elucidated the merits of the system reported at the World's Columbian Dental Congress at Chicago by Dr. Black, and strongly urged its adoption by the dentists of Ohio, and distributed a reprint of this report, that the members might understand the entire matter fully. He expressed a belief that the advantages of the system were sufficiently demonstrated, and that by its general adoption, dentists would be enabled to make

themselves easily understood when speaking or writing upon any subject. The debate which followed was in support of the propositions advanced.

In the "Cosmos" for 1905 appears an article by Dr. John E. Graves, of Amsterdam, Holland, read before the Fourth International Dental Congress held at St. Louis, Mo., in 1904. It is devoted to "a classification of the various forms of occlusion of the teeth," with the nomenclature involved. In this, quotations are made from Carabelli's nomenclature used in Vienna, in 1844; Sternfeld's, used in 1891, and also Iszlay's "Nomenclature for the Forms of Mal-Occlusion," published from 1881 to 1891. The author urged the present needs of a definite general nomenclature in the science of orthodontia.

There was also read before this congress a report of the committee on nomenclature, presented by its chairman, Dr. A. H. Thompson, of Topeka, Kan. In it great credit was given to the report of the committee on this subject submitted to the congress at the World's Columbian Exposition—which "undoubtedly exercised a great influence on the profession, and stimulated the appreciation of the necessity for formulating a better nomenclature, and interested students in the investigation of the subject. We may even hope that it assisted at the birth of a conscience on the subject, and that writers and speakers have perhaps better than ever before realized their responsibility to the profession and to the public, for their influence in the use and presentation of a proper terminology."

One of the recommendations urged by this committee was "that a spirit of loyalty should pervade the profession that is sufficient to sink all preferences that are not in harmony with an acknowledged authority, and to accept their rulings, to the end of securing uniformity." There was also submitted as a part of this report, a work on "Prosthetic Nomenclature" written by Dr. George H. Wilson, of Cleveland, Ohio. Professor Dr. Hesse, of Leipzig, Germany, recommended the international use of a number of names of Latin designations in dental anatomy, and Dr. William T. Reeves, of Chicago, a number of expressions especially applicable to porcelain work.

At this congress the following resolution was adopted:

Resolved, That an international committee be appointed by the Federation Dentaire Internationale upon international nomenclature and the preparation of a list of professional terms which shall be interchangeable and translatable into English, German, French and Spanish; such committee to report at the Fifth International Dental Congress.

While dental nomenclature, in common with living languages, has not

yet been completed and is not finished, it is a great gratification to the student of dental progress to observe that much advance has been made in the unification of language peculiarly belonging to this science and art.

ORGANIZATION FOR MUTUAL DEFENSE.

DENTAL PROTECTIVE ASSOCIATION.

In 1889 the Dental Protective Association of the United States was formed and incorporated, with the object, as then announced, "to unite the strength of the profession, to contest the patents of the International Tooth Crown Company, the validity of which has not been established."

In the exactions of the Dental Vulcanite Company, under the Cummings patent, for the use of vulcanite in dental plates, and the extensive litigation to which the dental profession in the United States was subjected—which is referred to in this work in the chapter on Prosthetic Dentistry, written by Dr. Ambler—must be sought the origin and cause for the organization of the Dental Protective Association.

Dr. J. N. Crouse, of Chicago, was a sufferer under the exactions of that company to the amount of several hundred dollars. When the International Tooth Crown Company began its operations for extracting tribute from the dental profession, its representative invited him to become interested in that company and offered him a "big thing" for his co-operation. Upon the advice of the Honorable Charles K. Offield, he declined to meet this representative in conference and instead began making his preparations to fight this corporation, retaining Mr. Offield as the attorney for an association then in contemplation, but not yet organized, and paying him a retaining fee of \$1,000. A prospectus was sent out to every dentist, which contained the following:

First: Dentists are writhing throughout the country under having to submit to a grasping monopoly because single handed and alone they cannot afford the expense of contesting its unjust claims. Numbers are being annoyed and prosecuted for the infringement of patents whose validity has never been legally established, and there is every reason to believe never can be established if dentists are organized for defense.

Second: Practitioners have not forgotten the treatment they received at the hands of the Goodyear Dental Vulcanite Company, and from the fact that the International Tooth Crown Company is largely managed by the same individuals they can infer the treatment they may expect if they are unfortunate enough to be left in its power.

Third: If they do not defend themselves, but allow this company to prosecute its claims, they will have to pay a royalty on all or any banded or gold crown they have ever made or may make in the future.

Honorable Lyman J. Gage, then vice-president of the First National Bank of Chicago, and subsequently secretary of the treasury of the United States, became treasurer of this association, and the board of directors consisted of Doctors J. N. Crouse, Truman W. Brophy and E. D. Swain, all of Chicago.

Seven thousand dentists joined this association, each paying the required fee of ten dollars.

Considering that this was a purely voluntary organization, offering no security for the faithful discharge of the great trust imposed, and the honest expenditure of this in the aggregate large amount of money, the faith evidenced by this large proportion of the dental profession of the country in the integrity, fidelity and judgment of three men was certainly very great. The manner in which this trust has been discharged, speaks volumes in support of the proposition that high moral obligation and financial faithfulness are actively alive among us.

Section 12 and 13 of the bylaws of the association show the unusual powers given to the directors and the obligation of the members.

DIRECTORS, AND THEIR POWERS.

Sec. XII. The Board of Directors shall consist of three members, to whom the policy, conduct, property and affairs of the Association and its membership are hereby confided. The Board of Directors shall have power:

To accept or reject applications for membership in the Association.

To fill any vacancy that may occur in any office.

To levy and collect, if necessary, assessments which, in all, shall not exceed ten dollars per member.

To take entire charge of the defense of members of the Association in any of the States or Territories, when prosecuted for the infringement of patents, the validity of which has not been fully established, and with the funds of the Association to retain and pay one or more counsel of their own selection, and with the funds of the Association to pay and defray all necessary and proper expenses of any such litigation.

MEMBERSHIP.

Sec. XIII. Subject to the approval of the Board of Directors, any member of the Dental profession may become a member of the Association on payment to the Treasurer of a membership fee of ten dollars, and subscribing to the By-Laws of the Association.

In 1895, after this association had been in existence seven years, the "Dental Digest" informs us that so far in its history it had won every suit which had been brought against any of its members, and that "it has one suit now pending

with the International Tooth Crown Company, viz.: the Low Bridge Patent. Much time and effort have been spent in preparation of defense for this (we trust the closing) suit."

It was stated, however, that although this suit, if decided favorably to the association, may finally settle the claim of the International Tooth Crown Company and the Low bridge patent, it would not finish the work of the association, as it was then defending two other patent suits "Brought against its members by other patent companies, and in addition to these, still other suits are threatened." It was also made to appear strongly that the association was not formed solely to defend patent suits, "but to band the profession together and place it in a position where it can successfully resist extortion or injustice in any form."

A meeting of the association was held at Asbury Park, N. J., during this year, which considered the question of disbanding the association, after the decision in the case above referred to should have been reached, but it was decided that in view of the fact "that there were numerous corporations and combinations now kept in check by the association, and that if it were given up they would be an annoyance to the dentists," it was determined to continue the activities of this association. Its protection, however, was from that time on only to be given to members of the association.

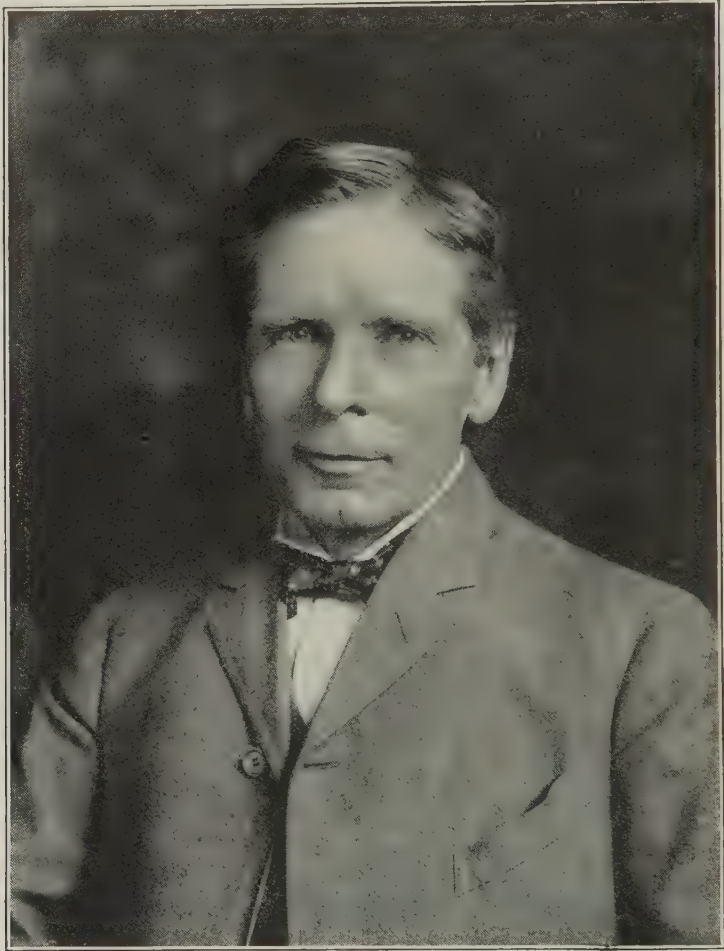
The United States circuit court of appeals for the district embracing the states of New York, Connecticut and Vermont, dismissed the suit brought to enjoin the infringement of the Low bridge patent, which was a great victory for the association. The value of the work accomplished consisted not only in a saving of a large amount of money to the members of the dental profession, but, great as the benefit was, the liberation and relief from the annoyance of all sorts of unjust demands, which gave dentists a period of peace and security from all such exactions, was infinitely greater.

In 1899, the International Tooth Crown Company succeeded in securing favorable judgment in which the Low bridge patent was involved. Immediately thereafter, that corporation repeated its demands upon dentists in the east, and went so far as to put receivers into the offices of a number of dentists in Boston, who were members of the protective association. This association took up the defense, had the keepers removed from the offices, and by June, 1900, forced the Crown company to pay all costs of proceedings, and put this corporation under "bonds for damages for illegal action."

The removal of these receivers' custodians or keepers required a bond for

\$45,000, which was promptly furnished by Dr. J. N. Crouse, and sent forward by telegraph.

Shortly after this, the parties who had been defeated, approached Dr. Crouse with the suggestion that a man of his energy and capacity ought to be



J. N. CROUSE, D. D. S.

a millionaire himself, and that they might suggest to him a way by which the road to affluence would be open to him. A request was made upon him for an interview, to take place at a Chicago hotel. During this interview, which was

held in the presence of a concealed witness, the proposition was made to Dr. Crouse that he, as the chairman of the directors of the association, should permit them to win two or three suits. In consideration of this, they would place at his disposal for his own use, a sum double as large as all the dues that had been paid by members of the association for its support, and that in addition, they would place him in a position to receive percentages of all the amounts to be collected in the way of royalties from the dental profession. This proposition was promptly declined, and the fight in the interests of the profession continued as loyally as before.

After the main fights were won, the directors found it necessary to raise more money to carry on succeeding litigation, and they determined, under the bylaws of the association, to levy an assessment upon the members. This assessment was only responded to by a very small number of the members. Human weakness seems always the same. When great danger was in sight and security against it was proffered, many availed themselves of its protecting fold, but after the danger seemed to be averted, only comparatively few felt like providing means to continue sustenance to the protecting power.

Early in the year 1900, the Crown company had commenced about fifty suits, all of them east of Ohio. Later they secured an order from a court in New York, which compelled one of the members of the association to present his books and have the same examined by a master of the court. This proceeding was objected to by the attorney of the association, but over-ruled by Judge Lacombe, and the examination of the books was carried out. This decision was used by the Crown company as an additional cudgel for intimidation of the dentists, but the following week when this company made an attempt in Boston to secure a decision in the same direction, the Federal court of appeals there refused their order and pronounced the procedure illegal.

An editorial in the "Dental Digest" for May, 1904, gives a full explanation of the final victory achieved by the association, from which the following is extracted:

This judge decided, and so ordered, that he had the power to compel the attendance of several members of the association before a court official, making them to submit to an examination, day after day, of all the work done by them in the mouths of their patients, of their books describing the same, and giving the names and addresses of each individual patient. This testimony was taken prior to the final trial, before a master in chancery, with a view to ascertaining how much crown and bridge work these dentists had done, the nature of the work, etc., and thus determining for how much they were liable to the Crown company.

One of these cases was afterwards tried before a jury under the instruction of a

judge, and a partial finding was made against the dentist. This case was then taken by the association to the United States circuit court of appeals for the second circuit, and by it sent to the supreme court of the United States upon the question as to whether or not any federal judge had the power to so compel an examination of any dentist in this manner.

The supreme court of the United States reversed the trial judge and decided that "in no patent case in an action at law can any dentist in this country be compelled, antecedent to the trial, to appear before any court official and be subjected to any questioning whatever regarding his practice or his patients."

The proposition laid down by the federal judge in New York, namely: "The practice of examining before trial under the New York practice, is the most wholesome one; it tends to simplification of the trial and frequently leads to settlement out of court," was probably correct, in the sense that the case would be simplified by such proceeding, and that a settlement without trial might be reached. But that the results under this New York code would inure to the securing of justice or equity is not so certain. The editorial continues:

We wish here to compliment the members who did act thus loyally and allow this question to be finally settled, as it has been in the supreme court of the United States, and who thus aided in annulling a practice which was harsh, vicious and indefensible.

We have been quiet about this litigation and this point, but will now frankly confess that if we had not succeeded in defeating this ruling the protective association would have been powerless to have aided its members in assaults made upon them under this practice. As the matter stands, however, every dentist in the United States has great cause for congratulation.

It is no disparity to others to state that the master mind that was ever watchful during the struggle that ensued between the American Dental Protective Association, and associated and other efforts against parties who were determined to wring unjust contributions from the members of the dental profession, under the guise of privileges granted by United States patents, was Dr. John N. Crouse. To his pugnacious persistency, loyalty and ability the dental profession in this country is indebted for its liberation, and for the freedom from similar impositions, it now enjoys.

DENTISTRY IN ARMIES AND NAVIES.

While the French admiralty prior to our Revolution required that their navy surgeons should have a knowledge of dentistry, as it was at that time understood, together with that of medicine and general surgery, the first effort to supply an army with the services of men to look particularly after

the teeth of the soldiers was made by England. According to the May number of the *British Journal of Dental Science* for 1857, the medical director general of the British army in an official report made the following recommendation:

Among the improvements in the conservative surgery, not the least remarkable and important is the successful application of mechanical ingenuity and skill, whereby the necessity formerly considered almost imperative, for the extraction of teeth affected with caries have been in a great measure averted. * * * I am, therefore, most anxious that all military medical officers should give the subject their best attention, as I am of opinion that a considerable gain to the service, besides comfort to individuals, would occur from the practice of dental surgery in the army to a greater extent than that which has hitherto obtained in military life.

Dental surgery in the army will, I feel convinced, if carefully practiced, exercise not only an important influence on the efficiency of regiments; will obviate the necessity of having recourse to the forceps in numerous cases, and will add to the comfort and health of the soldiers.

In 1859 Dr. McKellops of St. Louis, introduced a resolution in the American Dental Convention which resulted in the appointment of a committee to memorialize congress "on the necessity of appointing dentists to be attached to the regular army; and that we recommend the matter to the consideration of the general government." What work the committee which was appointed in this direction did, if any, does not appear, but it has been alleged with great authority that Jefferson Davis, while secretary of war of the United States, made an effort to employ dentists for the army. Possibly he would have succeeded in the accomplishment of this undertaking had not other cares and concerns, in another field, absorbed his attention.

On December 29, 1869, the Georgia State Dental Society at its annual meeting in Savannah adopted the following:

Resolved: That this society instruct their delegates to the American and Southern Dental Association to request said association to appoint dentists in the army and navy of the United States.

This resolution was presented by Dr. F. Y. Clark of Savannah, Georgia, who based some of his arguments upon experiences gained in the war between the States. He said:

"When the steamer 'Water Witch' was captured and the prisoners brought to Savannah, we learned that there was a dentist among the number and that he had quite a supply of materials. From this we were led to believe that our profession was recognized by the government and that dentists were appointed in the army and navy. Shortly after, however, when General Sherman and

his 100,000 men entered Savannah, we were, by practical demonstration, better informed. From daylight until dark our dental offices were besieged. The cry was for relief from present suffering; 'Do something for my teeth that will keep them from aching.' * * * Dental instruments were in great demand, and a dental depot would have done a smashing business in Savannah for a few days, at that time. Now could there have been such a demand, if there had not been a necessity?

"The innumerable quantity of broken teeth and fractured jaws produced by bungling instruments and unfamiliar hands, along with stories of rheumatic and neuralgic suffering caused by exposed pulps and diseased teeth, which we were obliged to listen to during the sojourn of the army in Savannah, were disheartening, and we determined then, should an opportunity ever occur, to contribute our mite towards a remedy.

"We cannot but think our general medical director was remiss in his duty in this respect. * * * At the north almost every state had its society. The American Association and the American Convention were in full operation, besides three or four dental colleges, and as many dental journals; yet with all this array of strength and talent we hear of little or no effort being made for the end in view.

"With us in the south it was different. We had no dental society or journal and, owing to the irregularity of the mails and stringency of conscription, we could not act collectively, but had to do what we could individually. As the war went on, and the call for men was renewed, and the conscription increased to (men of the age of) fifty, we were thinned to almost a corporal's guard. Many towns of several thousand inhabitants had no dentist.

"This state of affairs wrought a change little thought of. The inconvenience and suffering was too great to be endured, and their appeals became so numerous and urgent that the surgeon-general was obliged to recommend the detailing of dentists for many towns and to hospitals.

"The hospital practice was productive of so much good that the appointment of a dentist to each regiment was strongly urged as a means of increasing the active duty list of the army."

A memorial was presented to the Confederate government, of which the following is an extract:

Our own experience with soldiers, in and around Richmond during the last years, in connection with the statements of some of the most intelligent physicians and officers in the service, fully convinces us that out of every one hundred men sent to the hospital, or those on the sick list—exclusive of those wounded in battle—five, at least,

can be traced directly, or indirectly, to some derangement of the teeth that might have been remedied in a few minutes or hours. Thus we have of one hundred thousand men, five thousand unnecessarily off duty. Now this five thousand in every hundred thousand might be returned to active duty, or prevented from leaving it, by the appointment of a few dentists, say one to every army division.

The end of the Confederacy came, and with the other "lost cause" this effort also went into oblivion.

From that time until after the close of the Spanish war and the Philippine insurrection, the attention of congress was occasionally called to this subject in a desultory and spasmodic, but ineffective, manner, until finally, in 1901, congress authorized a corps of contract dental surgeons and attached the same to the medical department of the army.

The very interesting and exhaustive account of the work of this corps written by Dr. J. S. Marshall on the following pages, gives a complete history of this governmental recognition of the profession of dentistry, and its usefulness as a factor in the preparations for war and as contributory to the maintenance and effectiveness of the firing line.

While, perhaps, it may be humiliating to the professional pride of dentists that its representatives serving with the army have not yet been given the social standing, rank and emoluments of officers of the army, yet the profession has reason to feel very proud that the small band of its members who have labored with the army have everywhere received the commendation of commanding officers and superior medical officers, as well as the gratitude of the rank and file, for their efficient services. There can be no doubt that at an early date the congress of the United States of America will establish, both in the army and navy, corps of dental surgeons, thus taking pre-eminence among the nations of the world, in the solicitous care bestowed upon the preservation of the teeth of its soldiers and sailors, in proper keeping and accord with the pre-eminence of the development and skill attained by the dental profession of this country.

THE UNITED STATES ARMY DENTAL CORPS.

BY JOHN S. MARSHALL, M. D.

Examining Dental Surgeon of the Army.

For many years the dental profession has realized the fact that the benefits of scientific dental surgery should be extended to the officers and enlisted men of the armies and navies of all civilized nations, for the reason that

dental diseases are the most common of all affections of the human economy, and that few individuals reach mature life without having developed dental caries and other kindred diseases of the teeth and mouth.

The importance of the organs of mastication is so great as preservers of healthful digestion and assimilation that every effort should be made to conserve them in a healthy and useful condition. Such conservation of the teeth by prophylactic and operative measures would prevent much acute suffering and, it was believed, would greatly improve the general health, and thereby maintain a higher standard of efficiency.

From time to time various efforts have been made to secure the establishment of a corps of dental surgeons in the army and navy of the United States. Essays have been read upon the subject before medical and dental societies, and resolutions have been passed calling the attention of the war and navy departments to the great need of such service among the officers and enlisted forces of the army and navy, but no action was taken by the heads of these departments until after the opening of the Spanish-American war. Previous to this time all communications upon the subject were received with official politeness and "placed on file for future reference."

During the Civil war an effort was made to secure dental service in the Union army, but the idea was not received with favor by the war department. A similar effort was made in the Confederate army and it succeeded in so far that several dentists were regularly commissioned as members of the medical department and assigned for duty at the large hospitals. Notable among these was Dr. Bean, who became very successful in the treatment of fractures of the mandible by interdental splints. A certain amount of general dental service was rendered at these base hospitals, but the service was not carried to the men in the field.

In the Union armies the only dental service rendered was that of lancing a "gum boil" and the extraction of teeth. The latter service was usually performed by a hospital steward, whose only qualification for this service was generally the fact that he possessed a muscular right arm.

The victims, God rest their souls, after one experience with the hospital steward were not usually willing to submit to such treatment a second time, but preferred, as Hamlet said, to

Rather bear the ills we have
Than fly to others that we know not of.

In 1881 the writer of this article addressed letters of inquiry to several prominent military and naval officers requesting their opinion as to whether

or not dental surgeons were needed in the branches of the service to which they belonged. The officers to whom these letters were addressed were Generals U. S. Grant, William T. Sherman, Phillip H. Sheridan, W. S. Hancock and



JOHN S. MARSHALL, M. D.

Admiral David G. Porter. Without exception the military officers agreed that there had been great need of the services of dental surgeons in the Union army during the Civil war, and that there was equal need of such services among the troops at the frontier posts and stations. It was not an uncommon

incident for officers stationed upon the frontier to be obliged to travel hundreds of miles by ambulance, across the unsettled country infested with hostile Indians, in order to reach a dental surgeon and obtain the necessary treatment. The expense in time and money of such a trip was often very considerable.

Admiral Porter, in his characteristic manner wrote:

"Dental surgeons would be of the greatest benefit to the navy, especially when on long cruises. Had the navy been provided with dentists when I was a youngster I should not now be gumming it."

In an interview with General John M. Schofield, in 1883, he informed the writer that while he was in command at West Point Military Academy he was impressed with the great need of dental services for the cadets, but as no provision was made by congress for such service, he detailed a hospital steward, who had some knowledge of dentistry, to perform such service as he was qualified to render, allowing him to charge a small fee for such service.

The Annapolis Naval Academy fared better than the West Point Military Academy in this respect, as a regularly qualified dental surgeon was appointed by the naval authorities to care for the teeth of the cadets. This service began in 1852 and has continued without interruption up to the present time.

During the Spanish-American war the question of furnishing adequate dental treatment for the army was brought prominently before the war department through official reports of the suffering endured by the men on duty in Cuba and the Philippine Islands, from the fact that there were no qualified dental surgeons furnished to the army. Another and more determined effort was, therefore, made to induce congress to pass a bill authorizing the establishment of a commissioned corps of dental surgeons. Such a bill was prepared by Dr. Robert W. Morgan of Lynchburg, Va., and presented to congress by the Honorable P. J. Otey of Virginia, in May, 1898. Its provisions did not, however, meet with the approval of the surgeon-general, nor of the war department, consequently the measure advanced no further on its way toward enactment than the committees on military affairs of the senate and the house of representatives.

Later, through the efforts of the National Dental Association and its committee on army and navy dental legislation, Surgeon-General George M. Sternberg, United States army, was induced to approve a bill creating a corps of dental surgeons. This bill provided for the organization of a corps upon the contract basis, as it was thought to be something of an experiment and should be tried out before making it a permanent commissioned organization.

This bill was presented to congress with the approval of the secretary of war, and after a determined and practically undivided effort upon the part of the whole profession and the friends of the measure in congress, covering a period of about two years, it was finally passed and approved on February 2, 1901. The bill as it passed the house of representatives and the senate became a part of the bill to "Reorganize the Army," and incorporated in Section 18 on reorganization of the medical department, of which the dental section is as follows:

Provided, That the surgeon-general of the army, with the approval of the secretary of war, be, and is hereby, authorized to employ dental surgeons to serve the officers and enlisted men of the regular and volunteer army, in the proportion of not to exceed one for every 1,000 of said army, and not exceeding thirty in all. Said dental surgeons shall be employed as contract dental surgeons under the terms and conditions applicable to army contract surgeons, and shall be graduates of standard medical or dental colleges, trained in the several branches of dentistry, of good moral and professional character, and shall pass a satisfactory professional examination;

Provided, That three of the number of dental surgeons to be employed shall be first appointed by the surgeon-general, with the approval of the secretary of war, with reference to their fitness for assignment under the direction of the surgeon-general to the special service of conducting the examinations and supervising the operations of the others and for such special service an extra compensation of sixty dollars a month will be allowed;

Provided further, That dental college graduates now employed in the hospital corps, who have been detailed for a period of not less than twelve months to render dental service to the army, and who are shown by the reports of their superior officers to have rendered such service satisfactorily, may be appointed contract dental surgeons without examination.

The passage of this measure gave to the army of the United States of America the first corps of military dental surgeons ever attached to an army in the history of the world, and brought scientific dental treatment within the reach of the common soldier "without money and without price." No act of congress was ever received by the officers and enlisted men of the army with greater gratitude, nor has been more highly appreciated by them, than the attaching of dental surgeons to the medical department of the army.

Although the provisions of this bill were not satisfactory to the profession in general, particularly that section which provided that the dental surgeons should be "employed under contract," it was thought best to strive for its passage in this form rather than cause its defeat by insisting upon a commissioned status for the corps. The main idea at this time was to succeed in establishing a dental corps for the army, that the suffering of our soldiers

from dental and oral diseases, at that period so prominently before the country, might be mitigated, and the profession of dentistry recognized as a needful adjunct to that of general medicine and surgery in maintaining the health and physical efficiency of our armies in the field.

Surgeon General George M. Sternberg was unwilling to recommend to the secretary of war the passage by congress of a bill giving a commissioned status to dental surgeons, as he felt sure that it would not at that time meet with the approval of the military committees of the senate and house of representatives, but he gave assurances that should this bill pass, and the work of the dental surgeons prove to be as beneficial to the service as it was hoped it would, congress would undoubtedly look favorably upon a bill granting commissioned status to the dental corps, and that he would use his best endeavors to secure the passage of such a measure.

REPORT OF THE COMMITTEE ON ARMY AND NAVY DENTAL LEGISLATION.

At the meeting of the National Dental Association held in Milwaukee, Wis., commencing August 6, 1901, a report was presented and adopted from which the following is extracted:

In this the third annual report of your committee on legislation relating to dental surgeon service for the army and navy, we respectfully report our work concluded for the present, so far as appertains to the army, by the act of congress approved February 2, 1901, which provides for the employment of thirty army dental surgeons "under the terms and conditions applicable to Army Contract Surgeons."

As the provisions of this law are exactly the same, except that the number of dental surgeons was reduced from one hundred to thirty, as the widely published bill proposed by the secretary of your committee and submitted to congress through Senator Pettus of Alabama and Representative Otey of Virginia, it is not necessary to introduce it here.

In reference to securing legislation providing dental surgeons' service for the navy, we have to report that, in our opinion, the work already done directly and indirectly by the effort made for the army dental surgeon corps, has made it quite a simple and easy matter to succeed in securing legislation providing dental surgeons' service for the navy. Something of Surgeon General Van Reypen's views was reported last year. He has recently promised to consider and conclude the matter in time for this committee to take action as it may deem necessary before congress meets.

We, therefore, recommend that the matter be left to the committee on army and

For the complete report see the "Transactions of the National Dental Association, 1901," page 217.

navy dental legislation, with instructions to pursue such a plan as it may adopt after a conference with the surgeon-general of the navy and executive council of this association.

M. F. FINLEY, Chairman.
WM. DONNALLY, Secretary.
CHAS. S. BUTLER.
J. A. LIBBEY.
GORDON WHITE.

At this meeting of the National Dental Association, Dr. John S. Marshall, president of the board of examining and supervising dental surgeons, read an extended report of the organization and work of the board, extracts from which will be found under the head of "The Organization of the Army Dental Corps." After the discussion of this paper a resolution of thanks to the members of the dental examining board of the army for the faithful and efficient manner in which they have undertaken the arduous duties imposed upon them, with an assurance of the confidence of the National Dental Association, was adopted by a rising vote.

THE ORGANIZATION OF THE ARMY DENTAL CORPS.

John S. Marshall, M. D.; Robert T. Oliver, D. D. S.; and Robert W. Morgan, D. D. S., were appointed the examining and supervising board as provided for by law.

This board was convened in Washington, D. C., February 18, 1901, with Dr. John S. Marshall as president and Dr. Robert T. Oliver as recorder, and instructed by the surgeon-general to formulate immediately plans for the examinations, to be prepared to begin the work of examining candidates on February 25th, and to pass upon the professional qualifications and fitness, only of the candidates whom the surgeon-general invited to take the examinations. These invitations were extended to but one candidate at a time from each state and territory—according to their alphabetical arrangement—so that every section of the country might have an equal opportunity for representation in the dental corps.

The board presented the following plan:

First. The candidates shall be required to pass a satisfactory written and oral examination upon the following theoretical subjects, namely: Anatomy, physiology, histology, physics, metallurgy, chemistry, dental anatomy and physiology, dental materia medica and therapeutics, dental pathology and bacteriology, orthodontia, oral surgery, operative and prosthetic dentistry.

Second. They shall prove to the satisfaction of the board their ability to perform

all of the usual dental operations and laboratory work by clinical tests upon patients furnished for the purpose. These tests shall consist of:

Operative Dentistry. 1. The examination and recording of condition of mouth and teeth. 2. Preparation of cavities with hand and engine instruments. 3. Instrumentation and technique. 4. Preparation and manipulation of filling materials. 5. Insertion of fillings. 6. Treatment and filling of root canals and preparation of root for pivot crown. 7. Manipulative technique in removal of calcareous deposits. 8. Application of rubber dam, metallic separators, matrices, etc. 9. Diagnosis, prognosis and treatment of oral diseases. 10. Care and sterilization of instruments and hands.

Prosthetic Dentistry. 1. Impressions of plaster of paris and modeling compound, casts, bite and articulation. 2. Construction of a denture in vulcanite. 3. Construction of die and counter die from model to completion; carving the endulous model from a block of plaster of paris. 4. Construction of swaged plate, with metal and rubber attachments, also two shell crowns (bicuspid and molar) and one Richmond crown. 5. Construction of interdental splints (Gunning and Kingsley).

An average of seventy-five per cent was required in *each* subject for the theoretical, and eighty-five per cent for the practical examination.

This plan was approved by the surgeon-general and rigidly carried out by the board. The results of these examinations were as follows:

Number of candidates invited to take the examinations, 86. Declined to appear, 6. Failed to appear, 10. Total number examined, 70. Found qualified and approved, 19, or 27.1-7 per cent. Physically disqualified, 8, or 11.3-7 per cent. Fully examined and rejected, 3 or 4.2-7 per cent. Failed in theoretical examination, 7, or 10 per cent. Withdrew before completing the theoretical examination, 33, or 47½ per cent. Average age of approved candidates, 27½ years. Number appointed by the surgeon-general without examination by the board, as provided for in the law, 5. Total number of dental surgeons in the army at the close of the session of the board, July 31, 1901, including the examining and supervising board, 27.

The sessions of the board were not again resumed, but later in the season the individual members conducted separate examinations in San Francisco and Manila.

The following is a complete list of the members of the corps and their first stations:

NAME.	STATION.
John S. Marshall, Illinois.....	The Presidio of San Francisco, Cal., U. S.
Robert T. Oliver, Indiana.....	Manila, Philippine Islands
Robert W. Morgan, Virginia.....	Havana, Cuba
Siebert D. Boark, West Virginia.....	Philippine Islands
Clarence E. Lauderdale, New York.....	Philippine Islands
Franklin F. Wing, Montana.....	Philippine Islands
George L. Mason, Massachusetts.....	Philippine Islands

NAME.	STATION.
William H. Ware, California.....	Philippine Islands
Hugo C. Rietz, Wisconsin.....	Philippine Islands
Ralph W. Waddell, Ohio.....	Philippine Islands
Jean C. Whinnery, Nebraska.....	Philippine Islands
Frank H. Wolven, New Jersey.....	Philippine Islands
George M. Decker, Pennsylvania....	Philippine Islands
Frank P. Stone, Missouri.....	Philippine Islands
John H. Hess, District Columbia.....	West Point Military Academy, U. S.
Robert P. Updyke, Washington.....	Fort Leavenworth, U. S.
Wm. H. Chambers, Alabama.....	Fort Monroe, U. S.
Hugh G. Voorhies, Missouri.....	Porto Rico, W. I.
Wm. C. Fisher, District Columbia.....	Fort Sheridan, U. S.
Chas. J. Long, Iowa.....	Philippine Islands
Ord M. Sorber, Pennsylvania.....	Fort Sam Houston, U. S.
Edwin P. Tignor, Maryland.....	Fort Riley, U. S.
Alexander P. Bacon, Michigan.....	Cuba, W. I.
John A. McAlister, Indiana.....	Philippine Islands
George H. Casaday, California.....	Philippine Islands
Appointed from the army without examination as provided for under the law:	
Emmett J. Craig, U. S. Army.....	Philippine Islands
Samuel W. Hussy, U. S. Army.....	Philippine Islands
Charles A. Petre, U. S. Army.....	Philippine Islands
Douglas E. Foster, U. S. Army.....	Philippine Islands
Alden Carpenter, U. S. Army.....	Philippine Islands

On February 2, 1902, Dr. Robert W. Morgan was retired from the service by reason of disease contracted in the line of duty while serving in Cuba.

Dr. John H. Hess, on February 4, 1902, was promoted to the rank of examining and supervising dental surgeon, vice Dr. Robert W. Morgan, retired.

On February 12, 1902, Dr. Charles A. Petre died at Aparri, Cagayan, P. I.

Dr. John D. Millikin, California, was appointed March 3, 1902, vice Dr. John H. Hess.

Dr. Julien Bernheim, California, was appointed April 9, 1902, vice Dr. Charles A. Petre.

Dr. Rex H. Rhoades, California, was appointed November 10, 1902, vice Dr. Robert P. Updyke (resigned November 2, 1902, to accept a commission in the line).

Dr. William G. Hammond, Georgia, was appointed July 11, 1903, vice Dr. Alexander P. Bacon, resigned.

Dr. George E. Stallman, California, was appointed July 21, 1904, vice Dr. William C. Fisher, resigned.

Dr. George I. Gunckle, Ohio, was appointed August 16, 1904, vice Dr. George M. Decker, resigned.

Dr. Croxton L. Rion, California, was appointed September 25, 1905, vice Dr. Douglas E. Foster, resigned.

Dr. Douglas Foster, Oklahoma, was reappointed July 5, 1906, vice Dr. Hugo C. Rietz, resigned.

Dr. Raymond E. Ingalls, California, was appointed March 25, 1907, vice Dr. Frank P. Stone, resigned.

Dr. Robert M. Hollingsworth, California, was appointed July 1, 1907, to fill the vacancy caused by the increase of the corps.

In 1907 the dental corps was increased by one member in order that West Point Military Academy might be supplied with two dental surgeons, one, at least, to be constantly on duty at this station.

The distribution of the dental corps from 1902 to June 30, 1906, was as follows:

YEAR	UNITED STATES	PHILIPPINES	CUBA	PORTO RICO	TOTAL
1902	9	17	1	1	28
1903	12	18	—	—	30
1904	13	17	—	—	30
1905	16	14	—	—	30
1906	16	14	—	—	30

It was early recognized in their deliberations that successful practical examinations could not be conducted except by the aid of two complete operating and laboratory outfits. These were authorized to be purchased and set up in suitable quarters for the use of the board.

The next most important duty in the organization of the corps was the selection of the field or portable outfit.

After the furniture, instruments and supplies had been selected it was necessary to have special chests devised to hold them, so that they could not be displaced or broken in transportation.

Each dental surgeon in the field, or when itinerating from post to post in the military department to which he is assigned for duty, is furnished with one of these outfits, which contains all necessary instruments for operating upon the teeth, and sufficient supplies for a three months' service. The outfit is so light that it can be carried upon the backs of two mules, together with an army field-desk, two folding tables and two folding chairs. General hospitals and base stations were furnished with an additional outfit, or equipment consisting of a first-class operating chair, instrument case, electric engine, etc., and a complete laboratory equipment.

Another important question which confronted the board was the preparation of a nosological table for the use of the corps. The object in preparing this table was to secure uniformity in nomenclature, in recording the operations in the dental register and in making out the monthly returns. For the same reason it was necessary to establish a system of designating the individual

tooth. This was done by numbering them. For describing the location and character of cavities of decay, the kinds of filling materials used, the nature and character of other operations, and the treatment of diseased teeth, letters and combinations of letters were used, which is so simple that any hospital corps private could master it in an hour or two of study. These records are carefully kept on file in the office of the surgeon-general and will prove of great value after a few years in the study of etiology of dental and oral diseases, and will also be of considerable value to the pension office in detecting fraudulent claims for pensions by reason of physical disability claimed to have been induced from loss of teeth while serving in the army.

These records show every form of dental operation that has been performed upon each officer and enlisted man, and every form of disease treated.

According to the provisions of the army reorganization bill, which incorporated the bill proposed by the committee on army and navy dental legislation of the National Dental Association, the number of dental surgeons asked for (one to one thousand troops) was reduced to a total of thirty. As a consequence of this the dental corps has not been able to perform more than half the service that was really necessary. Reports from the dental surgeons show that the amount of professional service required of them by the great prevalence of dental and oral diseases among the troops at home and abroad made it impossible for them, during the first two or three years of this service, to do more than take care of the emergency cases constantly presenting themselves.

Besides this, there were frequent demands upon them by the families of officers and enlisted men and civilian attaches, particularly in Cuba and the Philippine Islands, where civilian dentists were few and only found in centers of population like Havana, Santiago and Manila.

The bill provided, however, that free dental service could be rendered only to the officers and enlisted men of the regular and volunteer armies. Army regulations fix the hours of service at 9:00 a. m. to 4:00 p. m. During these hours the dental surgeon is expected to devote his entire time and attention to the care of those persons who are entitled by law to his services, except in cases of emergency, but before and after these hours he may attend civilian attaches and others who may request treatment, and for this he is permitted to charge a regular fee. He is, however, required by a special rule of the surgeon-general to state in monthly reports of dental operations how many civilian attaches and others he has treated during each month.

Furthermore, we have been assured by scores of officers of the regular army

whom we have met in Washington that the dental corps will be most cordially welcomed wherever it may be sent, for there is dire need of its services, and this is particularly true in Cuba, Porto Rico and the Philippines. We are also encouraged by these gentlemen to believe that it is only a question of time when the corps will be made permanent by giving its members commissions. It will be necessary, however, before commissions can be obtained to first prove two things, namely:

Is the corps necessary to the health and efficiency of the army?

Does it pay in dollars and cents?

These will be the questions that must be answered to the satisfaction of congress before any more legislation along this line can be expected.

This corps has been given a chance to prove itself beneficent in an entirely new and untried field, with no precedents to guide, or experience to warn the members of the dangers in their pathway, or the obstacles to be overcome. But we believe that the dental corps of the army has proved equal to the occasion and brought honor upon the profession to which the members belong.

SUGGESTIONS UPON THE EDUCATIONAL REQUIREMENTS FOR MILITARY DENTAL PRACTICE.

The army dental surgeon, by reason of his military surroundings and associations, and the isolated position in which he will find himself professionally, will need to be broadly educated, and so expert in his calling that he will be capable of managing any case that may be presented to him for treatment.

In fairness to the board it should be said that the questions which have been submitted to the candidates have all been of an eminently practical nature, and so selected and presented as to test their general knowledge of each subject and their ability to apply this knowledge in a practical manner.

A less rigid and searching examination than this the board felt ought not to be expected; in fact, the dignity and honor of our specialty, and the future high standing and efficiency of the army dental corps, demanded that the examinations be as rigid and as thorough as the courses of instruction in our best dental colleges would make practicable. The members of the dental corps will naturally be compared in general education and professional attainments with their brethren of the medical corps, and it is to be hoped that in the comparison those of the same age and experience will make a favorable showing.

In order to stimulate the members of the corps to be studious and progressive, a system of examinations and promotions should be established. In order to accomplish this the corps must be commissioned and a sufficient number of higher grades established to make the prize worth working for.

The results of the examinations by our board have shown very conclusively that the colleges need to spend more time upon the theoretical subjects of the curriculum than they are now doing if they would thoroughly prepare their graduates for army dental practice. This was shown by the fact that nearly all the candidates who failed in their examinations were deficient in those subjects which are classed as the fundamentals, and of these the majority failed in anatomy, physiology, histology, physics, metallurgy, chemistry, dental materia medica, therapeutics, dental pathology and bacteriology, and the principles of surgery.

These examinations, it would seem, prove very conclusively that there is great need of raising the standard of the entrance requirements of our dental colleges, and of lengthening the course of instruction to four years, so as to be able to devote more time to the theoretical teaching. Our motto in dental education should, therefore, be "Excelsior."

Official letters and reports commending the services of the army contract dental surgeons and recommending their permanent establishment on a commissioned basis are on file in the war department from the following and other officers:

Colonel L. M. Maus, Surgeon, U. S. A.

Doctor Fitzgerald, an old army surgeon who served in the Spanish-American war.

Major W. O. Owen, surgeon, U. S. A.

Thomas B. Latimer, ex-army surgeon.

Major R. L. Fitzgerald, chief surgeon, Eighth Army Corps.

Colonel George F. Chase, commanding Twelfth Cavalry.

Colonel Marion P. Maus, Twentieth Infantry, U. S. A.

Surgeon-General O'Reilly, U. S. A.

General John C. Bates, U. S. A.

Surgeon-General Sternberg, U. S. A.

Major-General Fred D. Grant, U. S. A.

Brigadier-General George M. Randall, U. S. A.

The dental surgeons have by their treatment relieved and also prevented an untold amount of acute suffering, and have thereby added greatly to the comfort and military efficiency of the army. They have been the means of

saving thousands upon thousands of dollars to the government by conserving the health of the soldier and quickly returning to duty many cases on sick report from dental diseases that, without such scientific dental treatment, would have been incapacitated for duty for much longer periods.

In his report for the fiscal year ending June 30, 1902, the surgeon-general says that the services of the dental corps were highly appreciated by the officers and enlisted men and proved very satisfactory to the medical department. Much acute suffering was relieved and a large number of teeth restored to a healthy condition. Much loss of valuable time incident to diseases of the mouth, teeth and jaws was avoided. The report says:

The cost of maintaining the dental corps is small when compared with the relief from suffering obtained and the greater efficiency of officers and men who have received the treatment of the dental surgeons. The dental surgeon has become a necessity to the army. Early provision should therefore, be made for the establishment of a permanent corps of dental surgeons attached to the medical department.

The whole number of patients treated, according to the report, was 9,148, the reports from the Philippine Division being incomplete. The total number of treatments and operations—medical, surgical and mechanical—was 13,498. a highly creditable showing was made, notwithstanding the delay attendant on organization of a new department of the service and transporting and equipping the surgeons for work.

The surgeon-general's report for 1903 says that the character of the work of the dental surgeons had changed from a largely emergency nature and now, with a full complement of dental surgeons on duty, the men were being taught methods of prophylaxis, teeth were being conserved by proper treatment and restored to usefulness by fillings, crowns, bridges or artificial dentures. The whole number of patients—officers, enlisted men, female nurses and prisoners—treated was 16,161, or 20 per cent of the mean strength of the army. The whole number of treatments and operations was 49,483. The report says:

The work of the contract dental surgeons has been of a high order. Reports from experienced officers of the army indicate that appreciation of the faithful and efficient services of the army dentist is steadily growing among officers and enlisted men.

The report of the surgeon-general for 1904 says that the statistics gathered by the dental surgeons indicates that the requirements for enlistment as regards the teeth should be modified. He says:

At least eight sound opposing molars, two on each side in each jaw, should be required, and the condition of the other teeth as regards caries should be taken into account.

The number of diseases and injuries of the teeth and gums treated was 42,467; of the mouth and jaws, 507; total, 42,974. The number of operations upon the teeth and jaws was 47,241; upon the mouth and jaws, 37; artificial dentures, 314; total 47,592.

In 1905 the surgeon-general in his report said:

In the Philippine Islands 996.21 cases per thousand of the mean strength received dental treatment, and operations were performed to the extent of 1,052.43 per thousand, compared with 576.24 and 508.22, the corresponding figures for the United States.

The number of teeth affected by dental caries in white troops (who reported for treatment) serving in the United States was 376.08 per thousand men, compared with 376.50 for negro troops, and 73.33 the rate for Philippine troops so serving. In the Philippine Islands the number affected in white troops was 884.90 per thousand mean strength, while 31.71 per thousand of native scouts were treated for dental caries.

The total number of dental and oral diseases treated during the year was 43,513. The total number of operations performed was 41,727.

In 1906 fourteen dental surgeons were serving in the Philippine Islands and sixteen in the United States. The statistics from the surgeon-general's report follow:

In the Philippine Islands 951.61 cases per 1,000 mean strength received dental treatment and operations were performed to the extent of 1,047.73 per 1,000, compared with 608.55 and 579.54, in the corresponding figures for the United States proper.

The number of teeth affected by dental caries in white troops serving in the United States was 399.50 per 1,000 men, compared with 220.25 for the negro troops. In the Philippine Islands the number affected in white troops was 947.41 per 1,000 strength, while 17.96 per 1,000 of native scouts were treated for dental caries.

The total number of cases of dental and oral diseases treated during the period was 44,550. The total number of operations performed was 44,726.

FURTHER EFFORTS FOR LEGISLATION.

During the year 1902 the surgeon-general became so thoroughly convinced of the great value of the army dental corps, and was so pleased with this work and efficiency, that he proposed a bill for the Reorganization of the Dental Corps, in which it was provided that the whole corps should be commissioned, the personnel to consist of three captains and twenty-seven first lieutenants of infantry. This, however, met with the disapproval of the war department and nothing came of it except to encourage the corps and its friends to persevere in their efforts to gain a proper recognition of their profession in the army.

A similar bill asking for three majors, six captains and twenty-one first lieutenants mounted, was prepared by the members of the dental corps and forwarded to the war department in 1903 through military channels, and received the endorsement of the surgeon-general. This bill met a like fate at the hands of the general staff.

On December 20, 1905, the bill was presented to the Senate by the Honorable Senator, Mr. Pettus. It was read twice and referred to the committee on military affairs.

This bill was prepared by the committee on army and navy dental legislation of the National Dental Association, after conference with Surgeon-General Robert M. O'Reilly.

On February 1, 1906, the bill was reported by Senator Pettus, chairman of the committee on military affairs, without amendment.

This bill was passed by the senate on April 23, 1906, with a slight amendment changing the personnel of the examining board to "one army surgeon and two army dental surgeons," and sent to the house of representatives. It was referred to the military committee April 25th. It was amended in several particulars and reported to the house with the recommendation that it pass. The bill provided:

That a corps of dental surgeons, not exceeding forty-five, should be attached to the medical department of the army, all original appointments to be made to the rank of first lieutenant.

Appointees must be citizens of the United States, between twenty-two and thirty years of age, graduates of standard American dental colleges, of good moral character and of unquestionable professional repute, and shall be required to pass the usual physical examination and a professional examination; dental surgeons attached to the medical department of the army at the time of passage of the act, who were within the age limit at the time of their original contract, being eligible to appointment, three of them to the rank of captain and the others to the rank of first lieutenant.

The pay, allowances and promotions should be fixed by the regulations governing the medical corps; the right to command being limited to the members of the dental corps and such enlisted men as should be assigned to that service; the right to promotion being limited to the rank of captain after five years' service, and to the rank of major after ten years' service, provided the number of majors should at no time exceed one-eighth, and the captains one-third, the whole number in the dental corps.

No one should be appointed to the corps until he had served one year as contract dental surgeon to the satisfaction of the surgeon-general of the army.

The surgeon-general was authorized to organize a board to conduct the examinations, composed of two civilian dentists certified by the executive

committee of the National Dental Association and a third selected from the eligible army contract dental surgeons.

This bill would have increased the corps to forty-five in number, instead of one to one thousand of the regular army; excluded all contract dental surgeons who were beyond the age of thirty when they signed their original contracts from eligibility for commissions and made one year's satisfactory contract service necessary to make the candidate eligible for appointment to the permanent corps.

The bill, however, did not come up for passage, and all the labor of the committee of the National Dental Association, the friends of the measure in both houses of congress and the friends of the dental corps came to naught.

Since Dr. Marshall prepared the above, the Senate of the United States on January 29, 1908, passed the following bill upon the recommendation of the military committee:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

That to the Medical Department of the Army there shall be attached a corps of dental surgeons, which corps shall not exceed in number the actual requirements nor the proportion of one to one thousand authorized by law for service in the Regular Army, and all original appointments to said corps shall be made to the rank of first lieutenant.

SEC 2. That the appointees must be citizens of the United States, between twenty-two and thirty years of age, graduates of standard American dental colleges, of good moral character, and of unquestionable professional repute, and shall be required to pass the usual physical examination and a professional examination which shall include tests of skill in practical dentistry and of proficiency in the usual subjects in a standard dental course: *Provided*, That dental surgeons attached to the Medical Department of the Army at the time of the passage of this Act may be eligible to appointment, three of them to the rank of captain and the others to the rank of first lieutenant, on the recommendation of the Surgeon-General, and subject to the usual physical and professional examinations herein prescribed: *Provided further*, That the professional examination may be waived in the case of dental surgeons whose efficiency reports and entrance examinations are satisfactory to the Surgeon-General; and the time served as dental surgeons under the Act of February second, nineteen hundred and one, shall be reckoned in computing the increase service pay of such as are appointed under this Act.

SEC. 3. That the pay, allowances, and promotions of dental surgeons shall be fixed and governed by the laws and regulations applicable to the medical corps; that their right to command shall be limited to the members of the dental corps; that their right to promotion shall be limited to the rank of captain after five years' service and to the rank of major after ten years' service: *Provided*, That the number of majors

shall not at any time exceed one-eighth nor the number of captains one-third of the whole number in the said dental corps.

SEC. 4. That the Surgeon-General of the Army is hereby authorized to organize a board of three examiners to conduct the professional examinations herein prescribed, one of whom shall be a surgeon in the army, and two of whom shall be selected by the Surgeon-General from the contract dental surgeons eligible under the provisions of this Act for appointment to the dental corps.

SEC. 5. That the annulment of contracts made with dental surgeons under the Act of February second, nineteen hundred and one, shall be so timed and ordered by the Surgeon-General that the whole number of contract and commissioned dental surgeons rendering service shall not at any time be reduced below thirty.

The committee in submitting this bill, in part, used this language:

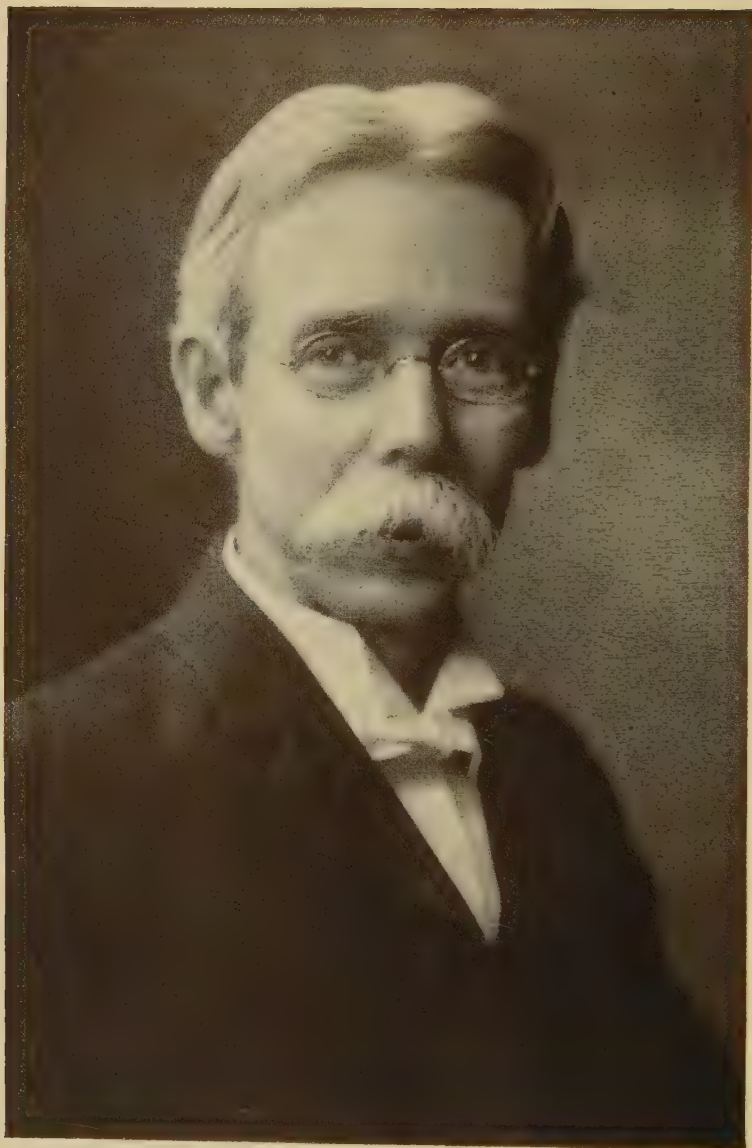
While the Military Committee, in recommending the passage of the bill, have been guided by a purpose to meet an urgent need of the Army on sound business principles, it is nevertheless gratifying to your committee to incidentally accord a small measure of recognition to a profession whose members have contributed much to the public weal and to suffering mankind everywhere.

It was received in the house of representatives on January 30, 1908, and sent to its military committee, who referred the bill to the secretary of war for his comments and suggestions. He, in his turn, sent it to the surgeon-general of the army for examination and recommendation.

This officer, on April 1st, returned it to the secretary of war with an endorsement of non-concurrence, on the plea of the possible expense that might be involved to the government, should it become a law. His language is as follows:

The enclosed bill, in my opinion, is defective and should not be passed in its present shape. I recommend that this matter be referred to the general staff for their careful consideration. Whatever may be the advantages of organizing a corps of commissioned dental surgeons I think it extremely important that any steps in that direction should be taken with a full knowledge of what must be expected if such a bill becomes a law. If congress gives its approval to a corps of dental surgeons such an act will simply announce that the government assumes the care and treatment of all persons who are now entitled to medical care and treatment. The conclusion that must be drawn from this announcement is that a sufficient number of commissioned dental surgeons must be provided to give this treatment, or the department must be supplied with means to procure the necessary treatment from civilian sources just as is now done by the medical department for medical treatment. With the present dental corps this would entail the expenditure of thousands of dollars annually. I think it is only fair to make this frank statement as I do not desire to, in any way, be the means of procuring the war department's approval of a bill that would ultimately entail great additional expense to the government, without doing my part in presenting all the facts necessary for the intelligent consideration of the measure.

It now seems as though there will have to be further delay in the final enactment of a law establishing a commissioned dental corps in the army, as the present congress fears that the appropriations will exceed the revenues of the government. It is a great disappointment to the dental profession that the surgeon-general should have felt impelled to take this view of the case, as that office in the past, as has been shown, has thoroughly appreciated the value of the services rendered by the dental surgeons in the army. It would seem somewhat surprising that an expense for the preservation of the soldiers' health, through this means, should not be fully as worthy of the necessary appropriations, as the care of their health, or the guarding against diseases engendered from other causes.



Edmund Noyes

History of Operative Dentistry

By Edmund Noyes, D. D. S., Chicago

THE practice of dentistry was formerly divided into three departments,—operative dentistry, mechanical dentistry, and oral surgery. Operative dentistry included the extracting of teeth (though this was sometimes classed as surgery), and all procedures for preservation or regulation of natural teeth, and the placing of crowns upon natural roots.

Mechanical dentistry concerned itself with supplying substitutes for the teeth whose roots as well as crowns had been lost, and, as an adjunct to oral surgery, in making splints for broken jaws, obturators and vela for cleft palates, etc., and to operative dentistry in making appliances for regulating teeth. The term mechanical dentistry was used for all those appliances made in the laboratory for use in the mouth which are readily removable or only temporarily fixed, like splints and regulating appliances.

The term “dental prosthesis” is now used instead of mechanical dentistry, and though etymologically it might be used with equal propriety to describe the restoration of the lost portions of the teeth by filling, its use in dentistry has become technical and limited to the construction of whole or partial sets of teeth, or of crowns and bridges; the preparation of roots for crowns or of inlay cavities for bridge abutments belonging to operative dentistry. Crown and bridge work, therefore, belongs both to the operative and prosthetic departments unless, as is now usual, it be called a department by itself. Orthodontia has also become a department by itself, and is now largely practised as an exclusive specialty. In the large cities a great part of the extracting of teeth is now done by those who confine their practice to that exclusively.

For the purposes of this writing, therefore, operative dentistry will be considered as limited to the extraction of teeth, the filling of them, and the treatment of the diseases of the teeth, gums, and alveolar processes.

We sometimes hear, in after dinner speeches, or in welcoming addresses at the opening of society meetings, by men who are not dentists, that dentistry was formerly no more than a trade, practiced by barbers and blacksmiths for the extraction of teeth, and the few who gave exclusive attention to it were jewelers or other mechanics whose facility in the use of small tools led them to undertake the practice of dentistry because it offered a more remunerative opportunity for the exercise of their mechanical skill and ingenuity, and it is often asserted that it is out of such beginnings that the profession of dentistry has been developed.

It is true that in the first half of the nineteenth century a large proportion of the practitioners of dentistry were not very much better than is implied in the above description, but there were during the same period a considerable number of notable and influential men of liberal education, some of whom were physicians, whose aptitudes or preferences caused them to take up a dental practice, and others who studied medicine because they realized the need of medical knowledge in the dental practice. These practised dentistry as a true medical specialty. Fox, Hunter, Bell, Koecker, Gardette, Hudson, Hayden, Chapin A. Harris and others belonged to this class. It was these men and not the others who laid the foundations of the dental profession. They founded the first dental college, the first dental society and the first dental journal. The results of their work remain influential for good at the present time and their names are remembered and honored, while most of the other class of practitioners are forgotten, and few of them left anything behind them of permanent value to the upbuilding of the profession.

It seems to the present writer worth while to make somewhat extended extracts from a work on dentistry published in 1832, which will perhaps very fairly represent the dental practice of the early part of the nineteenth century in England. The Philadelphia edition was evidently a republication from the English work. Upon its title page appears the following:

"A Practical Guide to Operations on the Teeth, with an Historical Sketch of the Rise and Progress of Dental Surgery, by James Snell, Dentist, Member of the Royal College of Surgeons, Lecturer on the Anatomy and Diseases of the Teeth, Author of Observations on Obturateurs, Etc., Etc., Pub. Philadelphia, Cary & Lea, 1832."

EXTRACTS FROM PREFACE.

In the preface of this book the author says:

"From the numberless treatises on dental surgery already existing it might appear to be a work of supererogation to offer another to the notice of

the medical public, * * * but in fact, with the exception of Mr. Bell's admirable work, the books which have been published for some years past, have been only literary advertisements to the public in general, to whom they have been most commonly addressed."

At the close of his preface Snell says "he has given Mr. Weiss in the Strand the patterns of all his instruments, * * * but enthusiastically desirous of diffusing information and improvement, he takes this opportunity of saying that it will at all times give him pleasure to show to any respectable member of the profession, the whole of his apparatus. He feels, and he wishes to impress that feeling on his professional brethren, that it is by liberal conduct alone that either the art or the artists can become respectable. Mystery and empiricism will degrade both the one and the other."

The book contains about 200 pages, fifty of which are devoted to extracting teeth and matters relating to it. The author prefers forceps for extracting almost all teeth, but admits that skill and much experience in their use are requisite, and in the absence of that he advises the use of the key for extracting the bicusps and molars. It is interesting to note that he regards the key as the modern instrument and the forceps the ancient one, having been used and described by Celsus and being comparatively little improved since his time. He says: "In this country (England), during the last century, the use of the forceps, in extracting the back teeth, appears to have been in a great measure discontinued in favor of the key instrument, until the former method was brought again into notice by Mr. Cartwright." He says in another place: "As, however, but few persons enjoy the opportunity of acquiring the perfect mastery of the forceps, it will be prudent in the majority of practitioners to resort to the use of the key." Snell himself seldom had recourse to the key, preferring the forceps because they give less pain than any other instrument and are liable to fewer accidents. He had a good variety of forms and was careful to have them shaped most suitably for the special uses of each; in particular the beaks, or "chops" were carefully fitted to the necks of the classes of teeth they were severally used to extract. He says: "The dentist should pay the most minute attention to the construction of his forceps. Whenever I have had a new set made, either for myself or a friend, I have invariably ordered them to be delivered in the rough, in order that I might myself do that which I have never yet found an instrument maker would do—render them exactly what they ought to be."

The author has a short chapter on mouth mirrors, and after describing those sold to dentists, consisting of an oval piece of looking glass set in a silver frame

with a hinged handle, he says: "These mirrors have always appeared to me to be very contemptible instruments; they are too small, and I have seldom seen one which gives a good representation." He had them made of steel in many different shapes and sizes, though he says "three, of different magnifying powers, will be sufficient." They were polished to the highest possible degree, they were warmed before using so as not to condense moisture from the breath and were carefully dried after use to prevent tarnishing and were very durable. When dulled they could be repolished.

Snell describes minutely the various uses of the file, which he appears to have relied upon for the removal of caries in every case where it could be accomplished without too great mutilation of the teeth.

The chapter on filling teeth, or "stopping" as he calls it, is very interesting, but in comparison with the present time very inadequate and unsatisfactory as regards instruments, materials, and modes of operating. He says "stopping teeth is an operation of very ancient date, having been used as a remedy for disease, as well as for the purpose of filling up cavities, if very large, in order to assist in the safe extraction of the tooth." He goes on to say: "There is no subject connected with dental surgery of more importance than that of 'stopping.' There is none better deserving the attention of the student, nor is there any in which the dentist may more successfully display his professional skill. Were we to judge indeed from the almost innumerable cases of failure which occur, we might conclude that the uncertainty of the operation was so great as essentially to diminish its utility and importance. These cases, however, generally occur under the management of ignorant persons, who are alike incompetent to the mechanical and the surgical part of the operation, and who are equally incapable of choosing the proper time for its performance." Again he says: "In stopping teeth it should always be remembered that there is no medium between complete success and the total want of it. If disease is not perfectly eradicated, the operation is in point of fact a failure. It is but procrastinating a little the destruction of the infected tooth. * * * The operation is at best one of considerable uncertainty. However early the diseased tooth may come under the care of the dentist; however judiciously it may be stopped, no one can predict with confidence that it shall not fall into decay at some other part, or several parts, at various periods after the operation."

We are certainly able now to take a more hopeful view of the probable benefits of filling teeth, though it must be confessed that Snell's

description corresponds too well with the history of many of the operations and many of the mouths of the present day. As to materials he says:

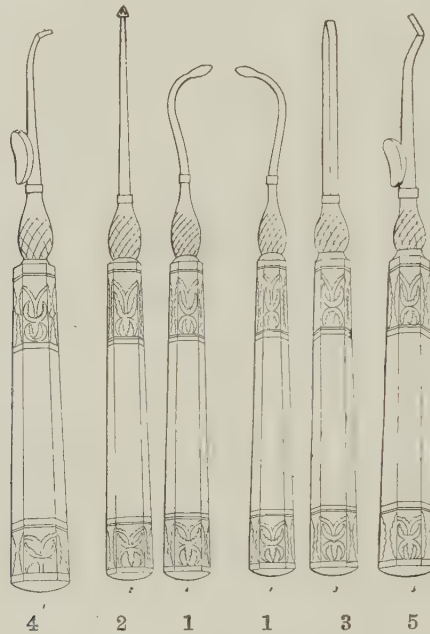
"Amongst the numberless things which have been proposed for stopping teeth, there is only one perfectly suitable, and that is gold. But as the public have been given to understand that there are newly invented cements capable of effecting all that is desirable in curing toothache, plugging up carious cavities, and permanently stopping the progress of the disease, and one advertising practitioner has gone so far as to promise to re-enamel the teeth with cement, it will be proper to make a few remarks on the subject. * * *

"The cements now in common use are principally of two kinds, mastic and metallic. The first is termed anodyne cement, and is used for the cure of toothache, but is merely a vehicle to retain something else which is to act on the diseased part, except indeed we allow it some share of utility in keeping the air from the cavity. This effect however, is, from the nature of the composition, very uncertain.

"Metallic cements are principally two kinds. Those composed of a combination of metals capable of fusion at a low heat—that of boiling water or lower—or those composed of granulated metal, either mixed up with amalgam of mercury or compounded with a gypsum. The latter are almost too worthless to be mentioned. They are, notwithstanding, productive sources of revenue to many advertising professors, who shamelessly impose upon the confidence of their patients. The former kind are occasionally useful as palliatives. Not that I would be understood as their advocate. I should recommend that every inveterately diseased tooth should be removed at once, with a view to preserve the healthy state of the mouth generally; because every such tooth is an exciting cause of inflammation, which, extending to the surrounding parts, the adjacent teeth eventually fall into decay. But as patients will not at all times consent to the removal of a tooth, but make up their minds to put off the evil day as long as possible, it will be found that the use of the fusible metals, for stopping, will postpone that evil day to a much later period than could be hoped for if the tooth was allowed to take its course. Before using them, however, the patient ought to be apprised that there is no hope of effecting a cure by such means and that the remedy is only temporary. * * *

"The fashion of using cements will, like others, pass away, and the great number of unsuccessful cases will accelerate its progress to oblivion. It is to be hoped, that in time, patients will be able to discover that educated men are successful in a far greater number of instances than even the most fortunate of advertising empirics.

"In describing the instruments necessary for the operation of stopping, I fear I shall be found to differ from many dentists, as well with respect to the shape as the number of the instruments required. The little variety offered by the instrument makers is absolutely a satire on the profession. * * *



Dr. Snell's Filling Instruments.

Dr. Snell gives the following description of his filling instruments (cutters and pluggers):

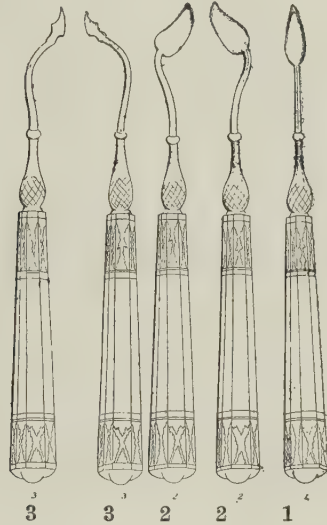
"In the plate the diagrams must be considered as merely intended to give an idea of the class of instruments suitable, from which may be framed numerous varieties to meet every description of case. * * *

"If the aperture is small, having an irregular shape, the enamel should first be cut with the file headed instrument (bur?) ; (Fig. 2) ; next, a broad shaped instrument (Fig. 3) the size of the aperture should be introduced, having curve, if the situation requires it. This should be rotated, in circles of the wrist, until the caries is removed entirely. This instrument will leave a cavity shaped precisely as is most desirable."

Fig. 1-1 are excavators for use in larger and more irregular cavities.

"The gold should be introduced with one of the stopping instruments (Fig.

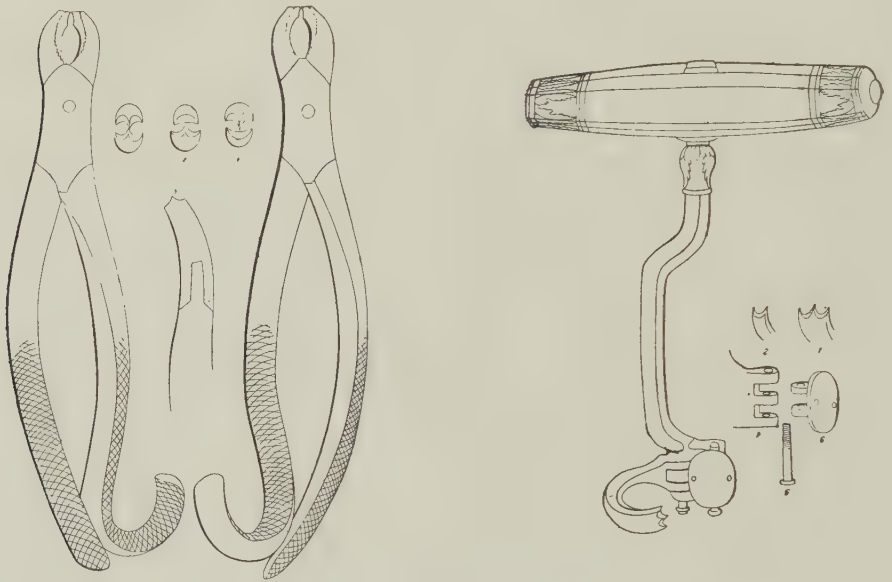
4 and 5), the instrument having a curve suited exactly to the situation of the aperture, and being somewhat less in circumference than the hole itself."



DESCRIPTIONS OF DR. SNELL'S SCALERS.

"For the anterior part of the incisors an instrument is sold in the shops, of a diamond shape, or spear pointed. The one which I use and would recommend is of a somewhat different shape, being about a quarter the breadth, and slightly turned up at the point, and the back of the instrument rising to an edge, instead of being flat. (No. 1). For the posterior part of the front teeth a pair of instruments are requisite, one for the right hand and one for the left, instead of the awkward triangular one sold for that purpose. * * * The blade part should be similar to the one for the anterior surface of the teeth, but considerably smaller and more turned up at the point. (See the plate Fig 3-3). * * * A thin flat instrument should be passed between the teeth to remove the tartar between their interstices. Two or three of this kind should be procured, varying a little in shape, breadth, etc. The insides of the molar teeth require also a pair of instruments, right and left, of a different shape from those used for the front teeth, being much broader, cutting on one side only. * * * (See plate Fig. 2-2). These six instruments are essential; others, however, are occasionally required. * * *

Although those I have named would in general answer the purpose, * * * if the dentist were possessed of no other varieties for this purpose he would be but indifferently supplied. The convenience of having instruments for the right and left sides of the mouth will, I think, be obvious. It is, I believe a new method. I have never seen it in use, nor heard of its being employed



Some of Snell's Extracting Instruments, 1831.

either for removing tartar or for extracting teeth. Although I lay a claim to the invention of these right and left hand instruments, I do so * * * with the admission that although I may never have seen or heard of such instruments, * * * it is not improbable they may have been already introduced."

The dentist should possess, first, a perfect set of instruments, of every shape and curve, for the proper removal of caries, however awkward the situation of the aperture; next, instruments of every variety of curve at the neck or shoulder, and in the diameter at that part which is to be brought in opposition with the gold when it is pressed into the tooth; and lastly an assortment of burnishers of different shapes, to finish the operation, by polishing the surface of the gold plug, and detaching any ragged portions."

A cylindrical cavity with a flat bottom is Snell's ideal, or it may be oval, but should always, if possible, have the diameter at the bottom no greater than at the orifice. After insisting upon the removal of every particle of caries and perfect drying of the cavity, he describes the operation of filling as follows:

"A portion of gold should be taken more than sufficient to fill the cavity; for should it be too small, it will be useless, as no second piece can be introduced with success. It must consequently be removed, and that part of the operation commenced afresh with a larger piece of gold.

"The gold should be introduced with one of the stopping instruments having a curve suited exactly to the situation of the aperture, and being somewhat less in circumference than the hole itself. The gold should not be pressed too hard until the hole is partly filled, but care must be taken that it thoroughly fills every part of the cavity as the operation goes on. Having firmly pressed the gold in, sufficient should be left to form a little cone; a stopper should then be chosen the exact size of the cavity with which farther pressure should be made, which if the instrument is well chosen and the gold properly inserted, will act upon every part of the plug. This being completed, all the extraneous gold should be removed and the operation finished by polishing the surface with a suitable burnisher."

The pulp of the tooth the author calls the "lining membrane" and refers to it by no other name. His treatment of diseased teeth for their preservation appears to have been limited to those with pulps alive. His remedies for sensitive, inflamed or ulcerated pulps are chiefly acetate of morphia, nitrate of silver and the actual cautery, the latter appearing to be a favorite treatment, which he describes in detail. He used a steel instrument with a bulb at the end into which was screwed a short piece of platinum wire. When heated to a white heat the bulb retained the heat long enough to keep the platinum wire hot to accomplish the purpose. In closing his description he says: "The use of the actual cautery has been condemned by some, and in its place the *argentum nitratum* substituted. I really think that this dislike to the former operation must have originated from its having been performed in an unprofessional manner, for it is superior in every respect not only to the common caustic, but to all others. Dentists occasionally recommend camphor, spirits of wine, and other applications to be applied, on lint, to a tender tooth, giving patients to understand that such treatment will eventually destroy sensibility. To the use of all such applications I would give a decided negative; morphine alone will occasionally be useful in slight cases. In all others it will be better either at once to extract the tooth, if it admits not of any

other remedy; or on the other hand, if it do, to apply the proper remedy in a decided and scientific manner."

These extracts will serve to show how little was attempted at that time in the line of operative dentistry and what meager resources in the way of instruments and appliances the dentists of that day had at their command. It has always been necessary to extract teeth and there have always been men who could do it, and the equipment for that purpose seems to have been fairly adequate, as it probably has been for ages previously. The filling of teeth with much prospect of durability seems to have been limited to occlusal cavities, possibly a few buccal and lingual ones, but from the author's account it would seem that proximal filling had little chance of permanence unless the adjacent tooth were lost or immunity to caries were established soon after the operations were made. Teeth in which the pulps became exposed appear to have been doomed to speedy loss or to a condition of chronic alveolar abscess.

The S. S. White Company published, in 1876, a history of dentistry in America which had been compiled and written for the American Academy of Dental Science, of Boston. The writers of that work appear to have searched the American literature of the profession pretty thoroughly, and as the book has been a good while out of print, it has seemed advisable to quote very freely from the chapter on operative dentistry instead of making an independent search through the same authorities. Credit is given in footnotes to the original sources of information the same as in the history.

A HISTORY OF DENTAL AND ORAL SCIENCE IN AMERICA.

S. S. WHITE, 1876.

"It is impossible to discover when, where or by whom the operation of filling teeth was introduced. It has been claimed for Celsus (100 B. C.), but the claim cannot, we think, be substantiated. The only reference to the operation in question to be found in the works of that writer is his recommendation to stuff with lead decayed and frail teeth *which are to be extracted*, in order that they *may not break under the forceps*.¹ (P. 51.)

"Up to the year 1800, the filling of teeth was an operation practiced only by the best dentists. It is probable that it attained a prominent position in operative dentistry sooner in this country than in others; for, in the works of most foreign (and particularly French) dentists, even so late as 1825, we

¹ Celsus de Medica, lib. 7, cap. 3, Sec. 5.

find comparatively little attention paid to this branch, and not much knowledge or method evinced in its treatment, when compared with the best practice of the time in our own country."

Dr. Frank Abbott in "A Centennial Review of Operative Dentistry," read before the American Dental Association in 1876,¹ quoted from John Hunter (1778). If decay has reached the pulp chamber he would advise "that the tooth be extracted and then immediately *boiled* to render it perfectly clean, as well as to destroy any life there might be in it, and then that it be restored to its socket; this will prevent any further decay of the tooth, as it is now dead and not to be acted upon by any disease and can only suffer chemically or mechanically."

Stopping the cavity may avail, he says, if resorted to in the early stages of the disease. Gold and lead were the metals most employed for the purpose. He says that in cases where so much of the tooth has given away that none of the stoppings would be retained, a small hole may be drilled in the sound portion and after the tooth has been well stopped a small peg may be put in the hole so as to keep in the lead, etc. Fox's work, published in 1806, states that caries is a disease which it is not in our power to arrest by any remedy whatsoever. As to stopping the teeth Fox says that in situations in the sides or between the teeth the pressure of the food is liable to displace the stopping and it requires frequent renewal.

Such extracts as these, made by Dr. Abbott, from old writers show very strikingly the imperfect knowledge and inadequate operations of that olden time.

"The earliest recorded material for filling is lead, used in the form of leaf. A piece being torn off, was rolled between the fingers into a ball or pellet sufficiently large to more than fill the cavity after packing, and was then forced into its place by one or two straight instruments, dressed off and polished with a burnisher."²

"The French word for "filling" (plombage, literally leading) is derived from its employment. The form preferred was the sheets used to line the chests in which tea was imported from China."

"*Gold*.—Harris says³ that gold was used as a filling in the early part of the eighteenth century, but we have not been able to discover any mention of it prior to that made by Fauchard, in third edition of his work (1785), book

¹ Cosmos, Vol. XVIII, pp. 595-601.

² Desirabode, loc. cit., p. 282.

³ Dictionary of Dental Science, p. 326.

II. p. 68. It is possible that it was employed previous to the last mentioned date, though certainly not to any great extent, for Harris notes the fact that it was not until the year 1800 that its use 'became common among dentists.'

* * * Among those of the better class of dentists who, residing in the large cities, had extra facilities for procuring gold it was early employed, but the greater number of practitioners did not use it ordinarily till long after the date mentioned by him.

"Dr. Eleazer Parmly¹ states that the first gold filling he ever saw was in 1815, and this was put in by Waite of London; and its introduction into America as a filling is ascribed by Parmly to Robert Wooffendale, who returned to New York from England in 1795.²

"Gold was first used in leaf as prepared by the gold beaters; but this, being very thin, was soon supplanted by rolled gold. For a long time there was no manufacture of gold expressly for dental purposes. A dentist in need of gold for filling procured gold coins, (preferably the Brazilian Johannes [Portugese], the purest of any gold money then made) and had them rolled by the gold beater into such thickness as suited his purpose.³ From ten to twenty grains was the ordinary thickness used. This gold, of course, was as non-adhesive as tin.

"About the year 1812-13, Marcus Bull began the gold-beating business in Hartford, Conn. Here Charles Abbey became his apprentice. While here, dentists would, to use the language of Mr. Abbey, 'borrow his rolls' to roll out their 'old Joes' (Johannes). Mr. Bull, arriving at somewhat of a knowledge of dental wants, gradually brought these customers to use his partially beaten gold leaf, taking their Johannes in exchange. In 1816, Mr. Bull moved his establishment to Philadelphia, where, in 1835, Abbey became his partner, and, upon the retirement of Bull, in 1839, took the business himself. The house relinquished the gold-leaf department in 1835, making dental foil its sole specialty. This was the first house in the country to be specially engaged in the manufacture of dental gold-foil and has, therefore, been thus mentioned.

"The first method employed in filling with gold was by pellets as has been described in treating of lead. Sometimes the pellet, *after its introduction*, was pierced centrally with a sharp instrument, and a cone shaped roll of gold

¹ Am. Journal of Dental Science, 1st Series, Vol. III, p. 2.

² Introductory lecture, by J. Brockway, Sr., before the Third District Dental Society, Albany, N. Y., 1869, pamphlet.

³ Am. Journal of Dental Science, 1st Series, Vol. III, p. 2.

forced into the consequent aperture, thus wedging laterally.¹ This method, with the thick gold then used, would not produce even a *good* filling except by the application of great force, to which there were very obvious objections. The foil then came to be made thinner, until as low as two grains to the leaf was used; but from four to six grains was the average weight of leaf.

“Upon the employment of light gold, the form of application became changed. A sheet was rolled or twisted into a ‘rope,’ which was packed by forcing it into the cavity in folds. In smaller cavities which would not admit a rope, the half or third of a sheet was *folded* over a watch spring or light strip of steel, and introduced in the same way as the rope.

“About the time from 1840 to 1845, isolated members of the profession began to *coil ribbons* of gold upon a winder, thus forming cylinders. These cylinders, however, were still inserted upon the principle of the old time pellet, being wound so tightly as to be little compressible, and to a size just sufficient to enter the cavity, into which they were forced, first by small and then by larger instruments, the coils being of sufficient depth to extend above the margin.² The principles of cylinder filling as at present practiced appear not to have been perfectly understood at that time.

“About 1851 the gross annual amount of gold foil used in the United States was about six thousand six hundred ounces, sold at an average price of thirty dollars per ounce, or a total amount of \$198,000.³

“In October, 1846, Dr. C. T. Jackson, of Boston, had a tooth filled with *sponge gold*, of the manufacture of which he had previously discovered the process.⁴ This was the first use of this form of gold for the purpose named. It attracted, however, very little attention from the profession until 1853, when Mr. A. J. Watt, of Utica, N. Y., and Mr. Joseph Barling, Maidstone, Kent, England, appeared (with it) in the field almost at the same time. Mr. Barling does not appear to have patented his preparation,⁵ but Mr. Watt did; not claiming the invention of the article, but its application to dental purposes.

“This preparation of gold was immediately heralded far and wide as the *ne plus ultra* of filling materials; but its first manufacture seems not to have sustained the claims made in its behalf, for it was so easily reduced to powder

¹ Desirabode, *loc. cit.*, p. 282.

² *Am. Journal of Dental Science*, 2nd Series, Vol. VIII, p. 3.

³ *Am. Journal of Dental Science*, 2nd Series, Vol. I, p. 228.

⁴ *Silliman's Journal*, 2nd Series, Vol. VI, p. 187.

⁵ *Dental Cosmos*, Vol. X, p. 131.

as to almost preclude its use in the upper jaw. * * * But the patentee quickly improved his process; and soon produced an article which was open to few objections.

"One of the greatest advantages claimed for crystal gold in its various forms was its capability of being packed in moisture or in the presence of almost any extraneous substance. It was said to have been tested by working it in water, saliva, and even flour, without destroying its cohesive properties in the least, or preventing its formation into a solid plug while in these media.¹ But experience in other hands seems to have required for it even more than ordinary care, as well in securing absence of moisture as in packing the cavity in such a manner as to prevent having the plug porous. It is probable that success in its use is more dependent on the skill and experience of the operator than in the case of ordinary foil."

These last statements much more nearly represent the truth, from that time to the present, than any of the extravagant claims often made by manufacturers and users of all the various forms of crystal, sponge, and fiber gold.

"In the spring of 1855, Dr. Robert Arthur, of Baltimore, advised the profession of a new method of preparing gold foil."²

This consisted in thoroughly annealing the foil over a spirit lamp before use; thereby developing its adhesive or cohesive property.³

"Immediately upon the publication of this process by Dr. Arthur, it was declared by numerous members of the profession that in it nothing new had been told them; that gold foil had been long used in this way. Indeed Dr. A. Westcott claimed to have accidentally discovered in 1840, and to have made use since then, of this property of gold.⁴ It will now be admitted that such was very probably the case. The fact is, that the greatest difficulty encountered by manufacturers in the preparation of foil was this very *stickiness*, as they called it. Their constant endeavor was to prevent issuing such gold to the profession; but it often got out despite their care. It is, therefore, probable that sticky foil was often used before Dr. Arthur published his method; though it is also probable that most of those who had used it were unaware of its value or special character, and, in many cases, supposed they were employing an inferior and undesirable article.

¹ Dental Cosmos, Vol. X, p. 136.

² Dental News Letter, Vol. VIII, p. 129.

³ The term adhesive was at first most commonly used, but the word cohesive soon became the one exclusively employed.

⁴ Dental Cosmos, Vol. XII, p. 57.

"The new form of gold soon became immensely popular. The manufacturers no longer found a difficulty in disposing of their sticky foil, for it was eagerly sought; and they immediately made and sold large quantities of this variety.



Robert Arthur

"Reasoning on correct principles as to questions of priority, the Western Dental Society at their meeting held in St. Louis, May 22, 1857, passed the following resolution.¹

"*Resolved*, That to Dr. Arthur, and to him alone, the dental profession is under obligation, for his liberality in laying before the profession the principle of using and welding together annealed gold, by the use of serrated pointed instruments, and that this Society desire to express their thanks to him for this, one of the real improvements in the mode of operating."

¹ Dental News Letter, Vol. X, p. 282.

"With crystal gold a new era had opened to the profession in the restoring with gold of broken and lost portions of teeth. This process was carried still farther with cohesive foil; and restored crowns came to be almost common. Then, also, occurred the initiation of 'contour fillings,' since carried to the perfection which is now apparent. Operations before almost unthought of were now commonly performed, and, in short, operative dentistry took a great stride forward.

"The range of weight of leaf of gold foil has been very extensive. From the first form of rolled 'old Joe's,' weighing ten to twenty grains, it dwindled to two or three; then, rebounding, went higher and higher, until some claimed approbation for using four hundred and eighty grains to the leaf. The weight now most used is an average of about four to six grains.

"*Platinum* has long been known as a tooth-filling material, though it cannot be said to have been *used* as such to any very great extent. * * * While the old pellet process was in vogue, platinum was used in this way; but its harshness and want of plasticity have prevented its use by the newer methods of operating. A different form, however, has been very lately introduced, which promises success. In it the platinum foil, made thin, is covered by a layer or deposit of gold. This preparation has not been long enough in use to warrant the expression of a final opinion. Alloys of platinum and gold have also been latterly introduced, the platinum being used merely to harden the foil for particular purposes. These forms constitute a very desirable addition to 'finishing foils.'"

The preceding quotation was written in 1876. The concluding statement has been verified by subsequent experiences and the platinized foils are standard preparations for use wherever force of occlusion or mastication is so great as to require increased hardness in the surface of the filling, and wherever, in the front of the mouth, it is desirable to modify the bright yellow color of pure gold.

"Silver (foil) was once used to a very considerable extent by the pellet method. It was found, however, to oxydize in the mouth, and possessed also the physical disadvantages of stiffness and want of ductility. It is no longer employed as a filling material.

"*Tin*.—Of the simple metallic fillings, excepting lead and gold, tin has been the most extensively used. It was not generally employed until about 1830, although isolated members of the profession put in tin fillings as early as 1822.¹ It grew in favor, especially for large cavities in molars and for the

¹ New York Dental Recorder, Vol. IX, p. 195.

cheaper class of operations. The time and labor necessary to fill a large cavity with gold were much lessened by the employment of tin, for it was softer and more pliable than even lead, and did not harden under the instrument like gold. It certainly oxydized, giving the tooth an ugly black color, and was, therefore, generally used only in the back teeth. It also wore rapidly away under mastication, but could be then cheaply, easily, and comparatively quickly replaced. In brief, it possessed several negative advantages which were opposed by few positive disadvantages, and, for many years, was very extensively employed by the best dentists, with hardly a dissentient voice.

"But the growing influence of gold at length made itself felt in opposition to the humbler metal. The introduction of various plastic fillings, too, operated against it, and its employment was finally very much reduced in extent, although it has never been entirely rejected, but is even now considerably used, in the less expensive class of cases."

Amalgam is responsible for the almost entire displacement of tin as a filling material. The only class of cases in which tin is the most suitable filling material is in enamel defects and slightly decayed cavities in occlusal surfaces in first and second molars of children who cannot be required to endure sufficient thoroughness in the operations to make gold fillings that can be permanently depended on. The tin fillings are expected to be temporary, but will almost always preserve the teeth perfectly till the children are old enough to have gold fillings made without difficulty.

Many operators use a combination of tin and gold, laying a sheet of each together, or one of tin with two of gold, or two of tin with one of gold; making the foundation of large fillings with this and finishing with gold. These operations, if made thoroughly and with good judgment, are very satisfactory.

PLASTIC FILLINGS.¹

"The first of these * * * were simple etherial or alcoholic solutions of some of the gums, as mastic, sandurac, etc.²

"*Terro-metallic Cement*.—This was composed of a mixture of sulphate of lime and oxide of iron. The celebrated anodyne cement was similar to it, with the addition of morphia. These cements served only a temporary purpose, the last also having as part of its object the relief of pain. Robinson says that a 'few hours' after their introduction, 'they dry, crumble, and fall out.'

¹ History of Dental and Oral Science.

² Robinson on the Teeth, p. iii.

The first plastic fillings which possessed in any degree the attribute of permanence were those sometimes called *fusible metal*. Two alloys may be mentioned as the principal. D'Arcet's *mineral cement* was first in the field. This is simply Newton's alloy, of eight parts bismuth, five lead, and three tin, with occasionally the addition of one-tenth part mercury to hasten the fusing. Fox¹ speaks of this process as one 'which promises to be very successful in all cases where the tooth is not tender and the caries is situated in the center.'² But all dentists were not thus lenient. Koecker² says of it: 'The destructive effects of this process are so evident, and consequently the impossibility of any beneficial result so certain, that I should consider it unnecessary to enumerate its pernicious consequences.' This, however, did not prevent the very extensive employment of the much anathematized material. In France this process was, for a time, more used than any other, and was also considerably practiced in this country, where it was introduced in 1820.³

"Wood's metal succeeded D'Arcet's, after an interval of disuse of the latter, in 1860.⁴ Like its predecessor, it enjoyed only an ephemeral popularity, and soon fell into disuse. The first of these alloys became plastic at 212° F. and the last at about 140° F. D'Arcet's was generally melted and poured into the cavity. Wood's had pieces placed in the cavity cold, and then made plastic with hot instruments.

"About the year 1826, M. Taveau, of Paris, advocated the use of what he called 'silver paste' for permanent fillings. Under this, as it were, shining title, was ushered into the world what was destined to be for years the Hydra of dentistry—*amalgam*. Its introduction into this country (the exact date is undetermined) is believed to have been by 'the Crawcours,' as have ever since been contemptuously denominated two French empirics who came to New York in 1833."

AMALGAM.

I am indebted to Dr. G. V. Black for most of the material for the following account of amalgam, he having kindly allowed me to make copious notes from the manuscript of his forthcoming book on operative dentistry. It has been rewritten from the notes, therefore quotation marks have not been used except in a few instances of direct quotations.

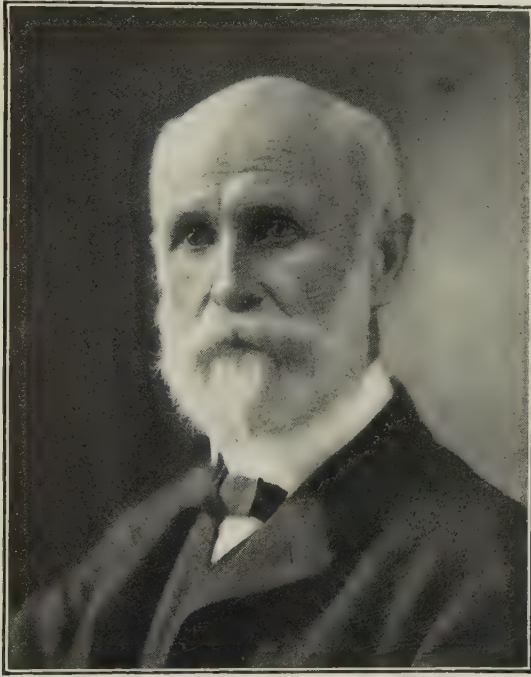
¹ Natural History and Diseases of the Teeth. 1833.

² Loc. cit., p. 396. (1826.)

³ Natural History and Diseases of the Teeth. 1833.

⁴ Dental Cosmos, Vol. IV, p. 59.

"Amalgam began to be used for filling teeth early in the last century. Who first introduced it is uncertain. At this time there were no dental societies or dental journals, and books or the memories of the older practitioners are our only sources of information. The authors of such books as make any mention of amalgam regarded those who used it as charlatans. By the time the first



DR. GREENE VARDIMAN BLACK.

societies were organized and the first dental journal published, about 1838-40, amalgam was considerably used, but chiefly by itinerants, and it was regarded with great disfavor by most of the better class of practitioners."

Such disfavor was justified by the unsatisfactory operations made with the amalgam first used, which expanded so much as to spoil its usefulness, but the cause of it was chiefly the unfortunate manner of its introduction in America.

About the year 1833 the Crawcour brothers came to New York and began to fill teeth with the "royal mineral succadaneum." They seem to have been

ignorant and incompetent professionally and wholly unscrupulous morally, fit antetypes of the worst of the advertising quacks of our own day. For a time they had a great following and the best dentists of New York found themselves sitting idly in their offices while many of their best patients were waiting their turns in the office of these quacks. Under such circumstances it was natural that most of the good men of the profession should array themselves in bitter opposition to these men and include in their condemnation the material they used, while it was equally natural that a few should begin to use the new filling material, either in response to the demands of their patients or to remove from them the temptation to go to the quacks. The operations made by the Crawcours appear to have been as slovenly and incompetent as it is possible to imagine and in time their true characters became apparent to the public so that they found it expedient to leave town, probably carrying with them a very satisfactory amount of money, and leaving behind them the seed which developed into the bitterest controversy that has ever occurred in the dental profession of the United States.

The most strenuous efforts were made for a long time to make amalgam itself as disreputable as the men who first introduced it in New York, and the endeavor to read out of the profession and expel from the American Dental Association all who used it, came near to disrupting the association; for an increasing number of unquestionably honorable and competent men recognized that amalgam had some merits and could be made to serve a useful purpose in practice. During the heat of the controversy (and to some extent since then), the most extravagant and the most ignorant assertions were made on both sides, as to its merits and uses on the one hand and its faults and injurious effects on the other. In time amalgam came to be used by almost the entire profession, by a great many very largely, by a much smaller number very sparingly, and a very few excluded it from their practice entirely. Among these perhaps the most conspicuous in later years were Dr. Jonathan Taft and Dr. H. J. McKellops, both of whom frequently declared they had never made an amalgam filling, and Dr. Taft would never allow its use in the school of which he was dean till his death in 1903.

The first amalgams were usually made from the filings of Spanish or Mexican silver coins, because these contain less alloy than the United States coinage and were more easily procured than pure silver. Such an amalgam is very difficult to amalgamate, makes a harsh mass, hardens very slowly but becomes very hard, and expands so much as to be very unsatisfactory, "most of them about as good as nothing, much actually harmful." It turns very black,

and usually stains the tooth to an inky blackness. At the time, the expansion was not recognized and the blackness was considered the most serious objection against its use. All the earlier experiments, therefore, had for their object an alloy for amalgam that would retain its own color and would not stain the tooth. This result was approximately accomplished by the introduction of a very large proportion of tin, which also made the amalgamation quicker and easier and the mass much more plastic and readily inserted. It also diminished somewhat the amount of mercury required, which was considered desirable. Dr. Elisha Townsend gave to the profession the formula sixty tin and forty silver, which came into very extensive use, and was imitated so closely by most of the makers of amalgam alloys as to make this proportion of silver and tin a fair representative, in all essential characteristics, of an overwhelming majority of all the amalgam fillings inserted during a very long period of time. [Dr. Ambrose Lawrence made an amalgam alloy which was extensively sold for a long time and which contained a somewhat larger proportion of silver and consequently made a rather better filling, but it tarnished rather more and worked less easily. Its use was therefore much less extensive than that of many of its competitors. It was not fully recognized for many years that the comparative freedom from tarnishing and staining had been accomplished by the acquirement of so objectionable a quality as shrinkage, and that to such a degree as to make the fillings leaky.] It is hardly too much to say that all the amalgam fillings made in America through a long period of years were leaky, the exceptions to that being so few as scarcely to be worth consideration.] When the profession began to appreciate this shrinkage and consequent leakage numerous efforts were made to find an alloy that would be free from this objection and various tests were used to determine leakage. The first experiments of much value were made by John Tomes of England, in 1861. (Transactions of the Odontological Soc., Great Britain, Vol. III.) Holes were made in ivory slabs like slides for a microscope, and these were clamped on another piece of ivory and the fillings made in the holes were examined with the microscope. Seven amalgams were tried, six of which shrank, one, of copper, did not, but copper amalgam wastes away in the mouth so as to be unfit for fillings. Dr. Thomas Fletcher, of Warrington, England, made fillings in short glass tubes and immersed them in ink, or carmine, or Prussian blue dissolved in water or alcohol. This test showed most of them shrank, some so as to fall out of the tubes. Dr. Black afterward found these tests very imperfect and inadequate, and also found that poor manipulation would cause the same appearances as shrinkage. In 1871 Charles Tomes determined

shrinkage or expansion by specific gravity, and also made experiments with various percentages of gold in silver-tin alloys.

Kirby (Transactions of the Odontological Society, Great Britain, 1871-2), made use of a V shaped trough in which to make fillings and measured contraction or expansion with a micrometer screw. Another test, for expansion only, was by making fillings in very thin glass tubes which were split by expansion. Dr. Thomas B. Hitchcock, of New York (Transactions of the New York Odontological Society, 1874) made fillings in a steel trough an inch long which he measured within 1/1000 of an inch by means of a lever with very short and very long arms. He tested about a dozen amalgams, but died before his results were completed, and publication was made from his notes by Dr. E. A. Bogue. Some experimental work was done in France and Germany, but it was mostly of a similar character. Dr. Adolph Witzel, however, tested fillings of known composition which had been worn in the mouth for some years by sawing through fillings and tooth, polishing and examining with a microscope.

Much was written about amalgams, especially by J. Foster Flagg, but it was mostly from a clinical standpoint and gave too little of accurate observation to be of scientific use. As a result of these various experiments three plans of measurement for shrinkage or expansion had been shown to be possible. First, by the microscope, examining fillings made for the purpose, by John Tomes; second, by the specific gravity test, by Charles S. Tomes; third, by a micrometer, by Thomas B. Hitchcock.

Great search had been made among possible metals for amalgam alloys and it had been conclusively shown that silver and tin must serve as the basis of them, no others proving usable in large proportion.

Some good resulted from these numerous efforts and experiments, and it is possible that if Dr. Hitchcock had lived, the main facts about amalgams might have been discovered a quarter century sooner. Nothing really decisive was accomplished till, in 1895, Dr. G. V. Black set himself systematically to the task of solving the amalgam problem.

It soon became apparent that most of the tests for shrinkage or expansion were either very unreliable or very inadequate. For instance, it was easily proved that the changes from day to day in the amount of moisture in the atmosphere of ordinary offices and homes would cause a greater amount of shrinkage or expansion in blocks of ivory, or in extracted natural teeth, than ever occurs in any amalgam. This implies, of course, that if these are used for making test fillings they must be kept all the time saturated with

moisture as is the case with natural teeth in the mouth, a very brief exposure to the air before inserting the test fillings being sufficient to cause enough contraction to spoil the reliability of the test. The first step in Dr. Black's investigation was to build a micrometer to measure to one ten-thousandth of an inch, the greatest difficulties being to "so arrange and intermingle the metals entering into the construction as to eliminate errors from temperature changes and to arrange to accurately remove and replace the tubes containing test fillings." A third machine had to be built before these results were fully accomplished. The second step was the purchase of a binocular microscope to corroborate by eyesight the readings of the micrometer, it being considered important to show the worthlessness of most amalgams in general use so plainly that every dentist looking at them would be convinced. Dr. Black says:

"The next problem was to find out what the manufacturers knew about amalgams, for there were many secrets in the trade. * * * In one way or another I obtained pretty much all of these secrets and have never given one of them away to this day. In value they did not amount to two good 'hills of beans.' I also obtained all of the principal formulas of the amalgams in the market for the purpose of studying them."

Dr. Black also obtained from the manufacturers ingots of their alloys for the purpose of studying the success or failure in compounding the alloys, as to whether they were true alloys or mixtures in part, and whether uniform in all parts of the ingot. "*A mixture of metals is not an alloy and has not the effect of an alloy in amalgam making.*" For making alloys Dr. Black finally used the closed electric crucible and melted and mixed in hydrogen. He procured cylindrical steel blocks or tubes about one inch in diameter and the same in length, into which holes were drilled five-eighths of an inch in diameter and of uniform depth, into which the test fillings were packed, having a small flat steel disc imbedded in the surface for the needle of the micrometer to rest against. This instrument measured the expansion or contraction in the depth of the fillings in the steel cylinders. The expansion or contraction of the circumference was easily observed with the microscope. (The contraction more readily and accurately than the expansion). A little practice enabled the observer with the microscope to anticipate the readings of the measuring instrument and vice versa. Having a stable material in which to pack amalgam and a trustworthy means of determining the exact amount of change in volume that might take place after it was packed, a series of experiments was made with alloys of silver and tin, which determined the fact that an alloy in about the pro-

portions of sixty-five silver and thirty-five tin, when freshly cut, would make a stable amalgam that would neither contract nor expand. He found, however, that fresh cut filings required more mercury, were harsher to work (amalgamated with greater difficulty), hardened more quickly, and would shrink less or expand more than if the filings had been standing for some time at ordinary temperatures. The ageing or annealing, as we now call it, is greatly hastened by heat. It is accomplished in fifteen minutes at the temperature of boiling water. If the cutting machine is run fast enough to heat the alloy sufficiently it is sometimes annealed in cutting. If filings are kept as cold as 17° F. annealing does not occur at all. The proportions required for a stable amalgam (that will not shrink or expand) after full annealing were found to be about 72½ per cent. silver and 27½ per cent. tin. A larger proportion of silver would make an amalgam that would expand and a larger proportion of tin made one that would contract. Most of the amalgams in general use at the time, having approximately forty per cent. silver and sixty per cent. tin, (with some modifications by the addition of other metals), would shrink enough to drop out of the steel tubes. Variations in the proportion of mercury used, while having important influence upon other qualities of the amalgam, had little or no effect upon expansion or contraction. The published account of these experiments and their results, and the demonstrations of them at numerous dental society clinics, at some of which fillings were made in the steel tubes and tested from a great number of different alloys brought by the members for the purpose from the supplies they were using in their offices, soon convinced the reading and thinking men of the profession that a radical change was needed in the amalgam alloys in general use. Many of the manufacturers sent representatives to attend a laboratory course given by Dr. Black for instruction in the scientific principles and facts, and the details of manufacture and testing which must be followed in the making of alloys that could be trusted to accomplish what we have a right to expect from amalgam fillings by reason of the newly acquired knowledge of the material. In a short time a number of new alloys were put upon the market which, if properly used, will make amalgam fillings that will not shrink.

Another characteristic of amalgam, determined and illustrated by Dr. Black in the same series of experiments, is what may be termed "flow." It is the disposition to move continuously under a given pressure and is due to the tin in the alloy. It is illustrated in this way. If a small cube of amalgam having a large proportion of tin be put under heavy pressure rapidly in-

creasing, it will stand till the pressure reaches a varying amount, from, say one hundred to seven hundred pounds, depending upon the alloy used and the manner of making and packing the amalgam, and then it will crush and fly in pieces. But if the same amalgam block were placed where a steady pressure of no more than twenty-five pounds is constantly acting upon it by means of a spring, the block will gradually spread and flatten so as to get away from the pressure without breaking. This change is called flow and may take place in the mouth under the repeated pressure or blows of mastication upon a filling. "Amalgam that flows under a pressure of fifty pounds is unfit for fillings in occlusal surfaces on that account, aside from the accompanying shrinkage in such over tinned alloys."

This work with the amalgam alloys by Dr. Black was done so thoroughly and the demonstrations were so easily observed and readily comprehended that there has resulted a very important improvement in the amalgam operations of all intelligent and progressive practitioners.

Much laborious and disinterested work was done by a considerable number of persons from time to time in experimenting with amalgam alloys and testing fillings, which want of space forbids us to describe or enumerate. History is chiefly concerned with such scientific and experimental work as is brought to a successful conclusion and results in beneficent changes in the practice of the profession, rather than with the work, however sincere, that is inadequate or unsuccessful to such a degree as to fail of any permanent or important results.

THE NEW DEPARTURE.

What has been since known as the "new departure" was based on the electro-chemical theory of decay and was for several years a subject of earnest controversy which resulted in a large increase of the use of amalgam, gutta-percha and the cements, and corresponding diminution of the use of gold for filling teeth. A large number of good operators never accepted the new departure creed, finding it impossible to reconcile its claims as to the behavior of fillings with their clinical experience. After the true theory of the etiology of caries was discovered and promulgated by Dr. W. D. Miller, of Berlin, the controversy over the "new departure" creed gradually subsided, though its influence can still be seen in the opinions and practice of many good men throughout the country. This creed was announced in a paper by J. Foster Flagg read before the New York Odontological Society in November, 1877. An editorial in the "Cosmos" for March, 1878 (Vol. XX, p. 174), pre-

sents the subject with clearness and brevity and sufficiently for the purposes of this history.

"The New Departure.—A very general interest is being manifested by the dental profession in the theories and practice which have come to be comprehensively designated as 'the new departure.' The action of filling materials upon dentine, as promulgated and ably discussed and advocated by Dr. S. B. Palmer, of Syracuse, N. Y., the result of earnest scientific investigation; the indorsement of his conclusions by Professor Henry S. Chase, of St. Louis, and Professor J. Foster Flagg, of Philadelphia, as the result of their observations and experiments; the modifications which these gentlemen are advocating and practicing, the outcome of these theories and deductions,—these constitute what is termed 'The New Departure.'

"Both theory and practice are so essentially, so radically, so diametrically in opposition to the theory and practice which have so generally obtained, that it is quite permissible to designate them by way of distinction as the 'accepted' creed and the 'new departure' creed.

"Whatever conclusions are finally reached, and whatever may be the practice of the future, it is at least evident that much discussion will result from these radical expressions of opinion.

"For the purpose of definitely informing our readers of the points at issue, we publish the two creeds in juxtaposition.

"The unanimity of thought in this matter with which the three gentlemen named are credited, may be appreciated from the statement that the 'new departure' creed, having been drafted by Professor Flagg, and submitted by him to Dr. Palmer and Professor Chase for revision, received their written indorsement without modification.

"ACCEPTED CREED.

- I. "Gold is the best material with which to save teeth.
- II. "Either 'contour filling' or 'separating teeth' is the best method to arrest decay.
- III. "Failure of operations is mainly due to defective manipulation.

"NEW DEPARTURE CREED.

- I. "In proportion as teeth *need* saving, gold is the *worst* material to use.
- II. "Neither 'contour filling' nor 'separating teeth' has much to do with the arrest of decay.
- III. "Failure of operations is mainly due to incompatibility of filling material with toothbone.

"ACCEPTED CREED."

- IV. "A tooth that is worth filling at all is worth filling with gold.
- V. "Unskillful and unscrupulous' dentists filled with tin covered with gold, thereby causing galvanic action, pulpitis, death of the pulp, abscess, and *loss of the tooth*.
- VI. "A filling, to be *good*, must *not leak*.
- VII. "Gutta-percha, *properly used*, is good enough for temporary fillings.
- VIII. "A *good* gutta-percha filling, in its proper place, is better than a *poor* gold one.
- IX. "Amalgam, *per se*, is a *poor* filling material.
- X. "The use of 'plastic' filling materials tends to lower the standard of dentistry, thereby diminishing its sphere of usefulness.

"NEW DEPARTURE CREED."

- IV. "A tooth that can be so treated as to be satisfactorily filled with *anything* is worth filling.
- V. "Skillful and scrupulous dentists fill with tin covered with gold, *thereby* preventing decay, pulpitis, death of the pulp, and abscess, and *thereby saving the tooth*.
- VI. A filling may be the *best known* for the tooth and yet *leak badly*.
- VII. "Gutta-percha, *properly used*, is the *most permanent* filling material we possess.
- VIII. "A *poor* gutta-percha filling *in its proper place*, is better than a *good* gold one.
- IX. "Amalgam, *per se*, is an *excellent* filling material.
- X. "The use of 'plastic' filling materials tends to lower that dentistry which has for its standard of excellence 'ability to make gold fillings,' but very much extends the sphere of usefulness of that dentistry which has for its standard of excellence 'ability to save teeth.'"

It may be doubted whether articles four and five of the "accepted creed" were ever generally accepted, certainly they were not universally. A great many men filled teeth with amalgam which, for various reasons, they could not, or did not think it advisable to fill with gold, and also a great many made combination fillings of gold and tin in various ways, in both cases irrespective of their belief, or notwithstanding their disbelief, in the new departure theories.

Article ninth was true at that time as regards almost all of the amalgams in use, but is not true now of the best of the amalgam alloys. With these a filling can be made, in a place appropriate for it, that will be a very close

second to one of gold, and there are some places and circumstances in which it is better, but not for the reasons set forth in the new departure.

"*Gutta-percha*.¹—This substance came into use as a material for temporary fillings in 1847-8,² and was very well received. Its use soon became almost universal."

In the "News Letter" for April, 1848, E. Blake, M. D., mentions various uses to which gutta-percha had already been applied—"taking impressions of the mouth, for bands, ligatures and springs for reducing irregularities, in setting pivot teeth, for temporary stoppings, etc."

"Hill's stopping was introduced in the early part of 1848 and patented in 1849. This was an attempt to render gutta-percha as available for permanent, as it had proved itself for temporary purposes. It was simply a compound of gutta-percha with quick-lime and powdered quartz and feldspar.³ * * * When first introduced and when prepared according to the patent specification, it was not of much value;⁴ but it was subsequently improved, being prepared (as is supposed) after another and secret formula, and obtained very considerable employment, which continues to the present."

Some of the older practitioners have asserted that the Hill's stopping made in the earlier time, perhaps in the fifties and sixties, was a better material and would make a more durable filling than that manufactured subsequently. It has been continuously manufactured and sold from that day to this, and it is more readily and conveniently managed for making temporary stoppings over treatment dressings, whether in deep cavities or in pulp chambers, than any other material. It is also admirable for root fillings used in combination with eucalyptol. It would probably have a much greater use for all sorts of temporary stoppings if the price were not so high. It has always been sold at from two to four times the price of most other gutta-percha stoppings, and an ounce of it costs about twice as much as a pound of base-plate gutta-percha.

In the "News Letter," January, 1857, C. Gibson Lum, of Vicksburg, Miss., said he used gutta-percha (Slayton's) to protect the pulp in deep cavities from arsenic used to remove the sensitiveness of the dentine, and for other purposes. This indicates that at that time some members of the profession had not yet learned that arsenic cannot be placed in contact with the dentine of a

¹ History of Dental and Oral Science in America.

² Dental Cosmos, Vol. VIII, p. 658.

³ American Journal of Dental Science, 2nd Series, Vol. II, p. 417.

⁴ Dental Cosmos, Vol. IX, p. 357.

tooth, even in shallow cavities and for a short time, without subsequent death of the pulp in most cases.

Gutta-percha was used very soon after its introduction for capping exposed pulps and is still used for that purpose. If wisely done it is doubtful if there is anything that is any better.

A considerable number of other gutta-percha preparations have been made and sold, varying in the amount and character of the foreign substances incorporated with it and the consequent degree of hardness and the higher or lower temperature required to render it plastic, and almost every manufacturer of dental supplies sells a preparation of his own, besides which there has always been a large use of the ordinary base-plate gutta-percha for temporary stoppings, setting crowns and bridges, etc.

*"Oxychloride of Zinc."*¹—This term was at first applied to the chemical compound it indicates, but has become almost the generic name of a certain class of filling compounds which vary considerably in materials and composition. It had its origin in an invention of M. Sorel for stucco work * * * (1856), consisting in a coating of oxide of zinc overlaid with a coating of chloride of zinc."²

The inventor suggested its employment "to stop hollow teeth, for which its plasticity and subsequent impenetrability to the moisture of the mouth render it particularly applicable." This "Sorel cement" the first of the oxychlorides, was used to some extent, but was supplanted by other nearly similar combinations.

"The specific compounds have received many appellations, as osteoplasty, crystal cement, diamond dentine, os-artificial, plastic bone, etc., according to the fancy of the manufacturers."

Fillings of these materials have never been regarded as permanent, though there have been instances of very unexpected durability. Before the introduction of the oxyphosphate preparations the oxychloride of zinc, in some form, had found a place in almost every operating case. Since then its use has been pretty closely limited to the capping of pulps and the filling of root canals, and even for these purposes by comparatively few practitioners.

Sometime in the seventies the oxychloride of zinc preparations began to be superseded for most purposes by the oxyphosphates. The oxide of zinc in these is similar, if not identical, to that used in the others, but is mixed with glacial phosphoric acid instead of chloride of zinc. It is stronger and more

¹ History of Dental and Oral Science in America.

² Dental Cosmos, Vol. IV, p. 358.

durable than the oxychlorides, and is so sticky that its adhesiveness is a material factor in the retention of crowns and inlays, and, in the estimation of many practitioners, of fillings also, especially in places where it is difficult to obtain quite sufficient anchorage otherwise.

The "Cosmos" for 1879 (Vol. XVI, p. 696) has an article by Dr. C. N. Pierce describing in detail the process of its manufacture. It had then been in use for some time.

At the meeting of the Mississippi Valley Association of Dental Surgeons, in March, 1892, ("Cosmos," Vol. XXXIV, p. 392), Dr. W. V. B. Ames, of Chicago, read a paper on "A New Oxyphosphate for Crown Setting." This is made of black oxide of copper and phosphoric acid, the oxide of copper replacing the oxide of zinc of the ordinary cements. It will absorb a larger proportion of the powder than the zinc cements. It needs to be very thoroughly spatulated and may be used very thin. It is jet black in color, but does not stain a tooth if there is no free copper in it. If there is it stains the tooth deeply and the copper salts deposited appear to be a permanent antiseptic, often preserving a tooth from decay after the filling is gone.

At that time Dr. Ames appears to have expected this form of cement would be most useful for setting crowns and bridges, but it has not come into any considerable use for that purpose, probably because of its black color. It has, however, proved very useful for filling the temporary teeth, and sometimes for the enamel defects in the occlusal surfaces of the first permanent molars as a temporary filling when, for any reason, tin or gold cannot be used. The application of heat after it is in the cavity causes it to set very rapidly.

In addition to what has been said in regard to the various materials used for filling it is necessary to give some account in a general way of fillings and filling materials. In the "Cosmos" for February, 1881, Periscope, Dr. Xavier Landerer, of Athens, quotes a friend of his who gathered old Hellenic skulls. "Among several hundreds, some perhaps two thousand years old, we found two with 'stopped teeth.' One was filled with a mass as hard as stone, which on analysis proved to be hydraulic lime, made from volcanic ash, santorin earth, and lime. The hollow of one tooth in the other skull had been filled with gold thread or gold leaf. The metal used was pure."

GOLD FILLING—HERBST METHOD.

Dr. G. C. Claudius, of Grenoble, France, described the Herbst method, at the July meeting of the Odontological Society of France. He said it was first mentioned and described by Dr. Bodecker in the January, 1884, meeting

of the New York Odontological Society, though originating with Dr. William Herbst of Bremen, Germany. (It seems probable that it has been publicly announced in Europe previous to this time.) In this method the packing of gold is done by rotating burnishers used in the engine. Cavities must have entire surrounding walls, either as found, or made so by use of a matrix. Cylinders are placed against the walls all round and polished against the walls with burnishers of suitable sizes. This polished surface is condensed further and slightly roughened by a small and corrugated burnisher, and more added. ("Cosmos," Vol. XXVI, 1884. p. 665-68.)

DURABILITY OF FILLINGS BY THE HERBST METHOD.

"At a clinic by Dr. W. Herbst at the S. S. White Depot in New York, in August, 1886, five approximal and two labial cavities were filled by the rotation method, and appeared to be quite perfect under careful examination. The patient, Dr. J. E. DaSilva, subsequently came under my care, and I found the cavity of every approximal Herbst filling showing a lining of decay at the cervical and palatal borders to an extent that necessitated the removal of each of those fillings. The labial fillings were in better condition, and because the patient was about to sail for Europe there was not time for removing them and refilling the cavities. Dr. DaSilva is very particular in the care of his teeth and it was through no fault of his that the fillings failed. There was no overlapping of the gold, but it was not condensed at the borders and so failed to preserve the teeth. The decay was of a white, chalky nature, and the teeth very sensitive." ("Cosmos," Vol. XXXI, p. 408, 1889. Dr. W. T. Onderdonk, New York.)

At a meeting of the First District Dental Society of New York ("Cosmos," Vol. XXVIII, p. 762-3, 1886), Dr. Reese described filling with cement and amalgam using soft oxyphosphate and packing amalgam into it at once, squeezing out as much cement as possible and when nearly filled with amalgam carefully freeing the margins from cement before completing the filling. He also made gold fillings in the same way.

In the discussion Dr. C. S. W. Baldwin said he had tried the method five or six years previously and said it was introduced and spoken of by Dr. T. B. Welch before he went into the dental manufacturing business. Dr. Baldwin concluded by saying, "I tried all of those experiments, and I found, as I believe most of you will find, that there is nothing quite so good to hold gold fillings as good, solid tooth material itself."

In the "Cosmos," 1886, (Vol. XXVIII, p. 471-8) in a paper on the "Lining of Cavities," Dr. A. B. Harrower of Philadelphia, goes to the extreme of advising the lining with varnish of all cavities before filling (if they can be kept perfectly dry), except in cases where some therapeutic effect is desired from the filling material. The varnish should be thin, if sandarac, about three grains to a dram of alcohol, preferably absolute alcohol, or preferably a mixture of sandarac and dammar varnishes. It should dry at least five minutes for an amalgam filling or ten minutes for gold. He also advises lining, for special purposes, with oxychloride of zinc, oxyphosphate of zinc, and gutta-percha, but gives emphatic warning of the danger to pulps from the phosphates. He says: "There is one quality which seems from experience to be justly attributable to the phosphates, and to which the oxychloride cannot lay claim; namely, the ability to silently and stealthily devitalize the dental pulp. This dangerous property should always be borne in mind, and when they are used in deep cavities the pulp should be carefully protected. Even in shallow cavities a lining of varnish should precede the introduction of any material containing phosphoric acid." The general experience of the profession since then does not justify this extreme fear of the effect of phosphate fillings upon pulps, except in deep cavities.

Dr. George S. Allan, of New York, read a paper before the First District Dental Society of New York entitled "Theory and Practice in Treatment of Proximate Surfaces," *Cosmos*, 1890, (Vol. XXXII, p. 255-273, and 368-387), in which, while admitting the theoretical correctness and advantage of the restoration of the natural forms of teeth ("contour fillings") he sought to show the limitations, exceptions and objections to the practice, and conveyed the general impression that the restoration of the natural forms of teeth should be very much restricted as compared with the almost universal opinions expressed by the writers of the time. He says: "No student depending on our literature only for a guide would for a moment hesitate as to the course he should pursue or have any doubt as to the manner in which the highest success was attainable." (Meaning that the current literature was all in favor of the restoration of contours.) He goes on to say, "In looking around he would be greatly puzzled at discovering, almost at the start, that the system which no writer defended was strongly intrenched and was protected by the great body of the profession, was in good fellowship with them, was their friend and companion in many a hard day's practice, and that they were not at all disposed to part company with it or to listen patiently when it

was maligned." (Meaning the practice of making "face fillings" instead of "contour fillings.")

The paper was long and cannot be fully represented in a sentence or two. Toward the end Dr. Allan said: "I am ready, though, to say that where all indications are favorable, contour work is theoretically and practically the best." There was a long discussion, participated in by Drs. A. W. Harlan, of Chicago; C. N. Pierce, of Philadelphia; W. H. Atkinson, H. J. McKellops, of St. Louis; L. D. Shepard, of Boston; Stockton, of New Jersey; W. C. Barrett, of Buffalo; G. L. Curtis, of Syracuse; R. Ottolengui, S. C. G. Watkins, S. G. Perry, and W. H. Dwinelle. The latter claimed the honor of being the "first contourist ever born." He said: "In this book, the 'American Journal of Dental Science' of 1855, I advocated the use of a plastic gold originated and developed by Dr. Watts and myself, by and with which I was enabled to construct contour fillings for the first time in the history of our profession. * * * The first contour fillings I ever saw were illustrated and described in this book. I had the good fortune to engrave the illustrations myself, and can vouch for their correctness. I early recognized the great truth that the nearer we get to nature the nearer we approach to perfection. * * * When we undertake to say that contour fillings are against the principles of nature, or that it is not good doctrine to advocate them, we are getting just as far away from nature and her examples." All of the men (previously mentioned) who discussed the paper, with possibly one exception, contended for the importance of preserving or restoring the natural forms of the teeth and that this ideal should be abandoned only when circumstances or conditions made its attainment quite impracticable, instead of being yielded frequently, or even commonly, as the essayist seemed to advocate. It seems a little strange that of "the great body of the profession" whom the essayist said practiced the making of "face fillings" only one should have appeared in the discussion to advocate them.

At the Midwinter Fair Dental Congress in San Francisco, in 1894, ("Cosmos," Vol. XXXVI, p. 823) Dr. E. A. Lundy of Hong Kong, China, read a paper in which the full contouring of fillings and crowns was advocated from the point of view of the protection of the interproximate gum.

PREPARATION OF CAVITIES—ENAMEL MARGINS.

In 1891 there appeared in the "Cosmos," a series of five articles by Dr. G. V. Black of Jacksonville, Illinois, on "The Management of Enamel Margins."

In the first of these he describes quite fully the structural elements and characteristics, and the physical properties of enamel; its developmental lines, the lines of cleavage, and the direction of the enamel rods in the different parts of the tooth surface; also the physical phenomena of caries of the enamel and the manner in which caries spreads in the dentine and undermines the enamel after it is penetrated. In closing the first chapter he says: "To so form the enamel margins that they shall have the greatest strength and give the best form for the adaptation of the filling material, requires an accurate knowledge of the direction of the enamel-rods on all parts of the margins of each cavity."

In the second of these chapters Dr. Black formulated the doctrine of "extension for prevention, or position of enamel margins considered in relation to recurrence of caries after filling." Extension for prevention is extension of the outline of the cavity, otherwise the enamel margin, "from a line of greater liability to caries to a line of lesser liability, or to change the phrase, it is to cut the enamel margin from the lines that are not self cleansing to lines that are self cleansing." He sums up the discussion of these forms and lines in three cardinal rules:

"1. Cut the enamel to such a point that the surface of the filling may be so formed that the enamel margin will be self cleansing, or be protected by the gum margin.

"2. Do not form an enamel margin in such a position as to leave a small portion of enamel between it and one of the developmental grooves.

"3. So form the immediate margin of the enamel that it will present no short ends of enamel rods on its outer edge, without sloping it outward so much that the filling material will not have good edge strength."

The last of the papers is devoted to a detailed description of the methods of packing gold in the various parts of cavities and over the enamel margins. The whole series of papers covers sixty or seventy pages of the "Cosmos," and any extended account or summary of them would be foreign to the purpose of this writing. The phrase, "extension for prevention," caught the ear of the profession, the character and reputation of Dr. Black commanded attention, and he was asked to explain and illustrate these doctrines and methods before various societies in different parts of the country. Considerable dissent and opposition was developed, some of it genuine and much of it through misapprehension of the proper applications and limitations of the principles set forth in the "Cosmos" papers. The widespread and long continued discussion of these and kindred topics has resulted in a very material improvement in the average excellence of operations by the more skillful and intelligent men of

the profession everywhere. It is true that the practice of extension for prevention was not new, but had been practiced to a greater or less extent for twenty or thirty years previously. (Probably there was very little extension previous to the advent of the dental engine except for the removal of decay and the obtaining of strong walls and margins. Occlusal cavities are an exception to this statement, however.)

A very little observation served to show that decay would often occur in the sulcus at the border of an occlusal filling if only the central decayed portion were cut out, forming the cavity by a rotating cut with a round bur, as some careless operators have been known to do. All good operators soon learned to cut in such a case to the end of the sulcus, to a place where the margin could be finished smoothly, with no crevice running to it, and this cutting is done quite regardless whether there is decay in the sulcus or not. This is the simplest case of "extension for prevention," and was generally practiced by all good operators for thirty years before these articles on the subject were written by Dr. Black.

Many operators had also noticed the frequency of recurrent decay at the buccal and lingual gingival margins of proximal cavities of bicuspid and molars, and, noticing also in many cases the lines of incipient decay running out from proximal cavities in these directions, had learned to extend the cavities more or less into sound or comparatively sound enamel and dentine.

In the "Cosmos" (Vol. XXI, p. 242, 1879) Dr. Safford G. Perry, of New York, in a paper on the "Management of Proximate Surfaces of Bicuspids and Molars," states pretty clearly the doctrine of extension for prevention, and also the protection of the gum in the interproximate space by the restoration of full contours as against permanent separations. Marshall H. Webb also, in an article in the "Cosmos" (Vol. XXIII, p. 593, 1881) entitled, "Restoration of Contours and Prevention of Extension of Decay," states distinctly the necessity of extension for prevention of proximal cavities toward buccal and lingual, and protection of interproximate gum by restoration of full contours.

In view of these and other similar facts and circumstances the question has been asked as to what especial value or originality there was in Dr. Black's presentation of these subjects. To this it may be replied that his statement of facts was so complete, his deductions from them so reasonable and convincing, his descriptions of tooth structures and of operative procedures were given with such minute details, and their application to most of the cases arising in practice so fully and clearly set forth that the knowledge, and the practice founded upon it, have since that time merited the designation of scientific,

to a far greater degree than ever before. Previous practice along these lines had been chiefly empirical and rather desultory and without any very general recognition as necessary and sound practice. In particular, Dr. Black's statement of the relation of cleanliness of tooth surfaces to immunity from decay, his definitions of the portions of the teeth that are cleaned by the movements of food over them, and hence described as self cleansing, the desirability (in proportion as the liability to caries is great) that cavities be extended to where their borders will be self cleansing, and the fact that decay does not begin on a surface protected by a healthy gum, whether it be a surface of enamel or dentine or whether it be the border of a filling, provided it is tight and is smoothly finished, had never been so fully set forth previously. Before this time Dr. Black's name and reputation had become known to the whole profession of America and Europe. As a result, therefore, of the reputation of the author and the thoroughness of his discussion of this subject, an unusual impression was made upon the profession generally, and it is scarcely an exaggeration to say that both the science and practice of dentistry took a step in advance which promises to be permanent.

In the "Cosmos" for 1895 (Vol. XXXVII, p. 353), beginning in the May number, is a series of five articles, some of them very long, by Dr. G. V. Black, entitled "An Investigation of the Physical Characters of the Human Teeth in Relation to their Diseases, and to Practical Dental Operations, Together with the Physical Characters of Filling Materials." This series of papers made known the results of an enormous amount of experimental work in the laboratory and innumerable tests of natural tooth structures and of filling materials, for which many instruments of precision had been devised by the author and made by him or under his supervision. The results of this work seemed to make necessary a change in the point of view, and the opinions and modes of expression of the profession generally as respects the relation of the physical characters of the teeth to liability or immunity to dental caries, and to compatibility or suitability for the use of various filling materials. This point of view and these opinions may be indicated by a short quotation from the introductory portion of the first of these papers. "It may now be said that the hypothesis that the condition of the tooth structure, in a large degree, renders the tooth susceptible or unsuspceptible to caries exists in full force in the minds of a large proportion of the members of the dental profession. We see constantly in dental literature allusions to 'frail teeth,' 'chalky teeth,' 'hard teeth,' 'soft teeth,' 'dense teeth,' that this patient's teeth have become soft and are melting down rapidly; or that patient's teeth are hard and firm

in structure, etc. Also we read frequently of the selection and adaptation of filling materials to teeth that are 'frail in structure,' or to 'soft teeth,' and of the adaptation of filling materials to hard, firm teeth, etc. In a search of the literature for the basis upon which this idea of the differences in the condition of the tissues of the tooth rests, it is found to be an interpretation derived from certain clinical appearances. It often happens that the teeth of certain persons have manifested little or no tendency to decay for years, and then, almost without warning, rapidly progressing caries attacks a considerable number at once, melting them down rapidly. The interpretation is, that such teeth have become soft. This has been especially noted in pregnant and nursing women. * * * Also the idea is prevalent that such teeth have, in some way, lost lime salts; have, in a word, become less dense in structure. As to the facts of the occurrence of this rapidly progressive caries, where little or none existed before, there can be no question. * * * Also many cases are observed in which caries has progressed rapidly for a time and then practically ceased; or has become easily controlled by the usual means. The question at issue in this investigation is not as to the occurrence of the conditions represented by rapidly destructive caries. These cases occur as represented. But the question presented here is the one relating to the supposed change in tooth structure. * * * Does this softening of the structure of the tooth occur otherwise than by the direct action of the carious process, and if so, in what degree? Two well known facts have seemed to argue against the interpretation that the clinical appearances mean soft or softening teeth. First, the teeth are the hardest structures of the body, and are of the lowest vital endowment as to self repair, and are therefore the slowest in vital changes. Second, caries, according to present accepted theories, attacks the teeth from without, beginning upon the outside, and presumably the physical or vital condition of the teeth themselves has little to do in the case. * * * The question as to the truth of these propositions will be a principal subject for instrumental determination."

No account can be given here of the very elaborate series of tests and experiments, nor any description of the instruments and apparatus used for the purpose, and the conclusions to be derived from them can best be given in Dr. Black's own words:

"CONCLUSIONS.

"From the facts developed in this investigation, it seems that the following conclusions may be summarized.

"The teeth are strongest in youth and early adult age, diminishing somewhat in strength with advancing age.

"Teeth that have lost their pulps and have become discolored lose strength in a marked degree, apparently from a deterioration of the organic matrix.

"Teeth that have become badly worn from mastication, and in which the pulps become so much calcified as to cut off the nutrition of the crown portions of the dentine, lose strength apparently from deterioration of the organic matrix.

"Teeth of old people, and especially those in which much calcification of the pulp occurs, deteriorate in strength.

"There is no basis for the supposition that the teeth of children under the age of twelve years are too soft to receive metallic fillings.

"Differences in density or in the percentage of lime salts in the teeth is not the controlling factor in the strength of the teeth nor their hardness, this seeming to depend upon the condition of the organic matrix.

"Differences in the strength of the teeth have no influence as to their liability to caries. Difference in the density, or in the percentage of lime salts in the teeth, have no influence as to their liability to caries.

"The active cause of caries is a thing apart from the teeth themselves acting upon them from without, and from a consideration of the facts thus far developed, the logical inference is that the cause of the differences in the liability of individuals to caries of the teeth is something in the constitution, operating through the oral fluids, and acting upon the active cause of caries, hindering, or intensifying, its effects.

"Caries of the teeth is not dependent upon any condition of the tissues of the teeth, but on conditions of their environment. Imperfections of the teeth, such as pits, fissures, rough or uneven surfaces, and bad forms of interproximate contact, are causes of caries only in the sense of giving opportunity for the action of the causes that induce caries.

"The objects to be attained in filling teeth are the perfect exclusion from the tissues of the causes of caries by sealing the cavity, and securing such form as will prevent lodgments of debris about the margins of the filling, and thus prevent the further action of the cause of caries.

"There is no basis for the supposition that some teeth are too soft, or too poorly calcified, to bear filling with gold, or other metal in use for that purpose, since all are found to be abundantly strong.

"There is no basis for the selection and adaptation of filling materials to soft teeth, hard teeth, frail teeth (in structure), or poorly calcified teeth.

What basis there may be in conditions surrounding the teeth for the selection and adaptation of filling materials must be left to future developments to discover.

"With our present knowledge, the only basis for the selection and adaptation of filling materials to classes of cases is the individual operator's judgment as to which he can so manipulate as to make the most perfect filling, considering the circumstances, his own skill, and the durability of materials.

"There is no basis for the supposition that calcic inflammation of the periodontal membranes or phagedenic pericementitis (so called pyorrhea) attacks persons who have dense teeth in preference to those whose teeth are less dense.

"There is no basis for the treatment of pregnant women medicinally with the view of furnishing lime salts to prevent the softening of their teeth, or with the view of producing better calcified teeth in their offspring."

The second paper discussed "the force exerted in the closure of the jaws," and that required for the crushing of various kinds of meat and other articles of food, and gave a history and description of the instruments used for measuring these forces. Dr. Black says: "It seems curious that men should have filled teeth all these years without having entered into a closer study of this subject than that afforded by clinical observation. In May, 1893, I presented a paper to the Illinois State Dental Society on the anchorage of proximate fillings in bicuspid and molars, in which the stress exerted in the occlusion of the teeth was treated as an unknown quantity. Attention was somewhat strongly called to the fact that it was unknown, and to its important relation to the anchorage of fillings. Within the next two months two members of the Illinois State Dental Society devised and constructed instruments for measuring the stress exerted by the jaws, both of which were presented at the World's Columbian Dental Congress which met in Chicago. One of them was the late Dr. Patrick of Belleville, Ill., and is illustrated on page fifty-three of the published proceedings. The other was by Dr. George J. Dennis, of Chicago, who presented to the congress a paper on the subject."

The instrument for this purpose is called a gnathodynamometer and Dr. Black made several of them, seeking to overcome the various difficulties of construction, which proved to be very great, and finally got one that proved fairly satisfactory and strong enough so that only a very few individuals were found able to close the jaws together, thus registering the full capacity of the instrument. Dr. Black does not believe the instrument will give a perfectly accurate test of the force of the jaws, but thinks there is a probable uncertainty of at least ten per cent., the actual force that may sometimes be used upon food

being probably greater than that registered by the gnathodynamometer. The range of power in the jaw muscles of different persons proved to be very great, the table given showing from thirty pounds to one hundred and forty pounds upon the incisor teeth, and from seventy pounds to two hundred and forty pounds upon the molars. To determine the stress necessary in the mastication of food, especially of meat, Dr. Black devised an instrument which he called the phagodynamometer, consisting of molar teeth of brass, cast in molds made from upper and lower natural teeth. The ones representing the upper teeth were attached to a slide which acted upon a stiff spring, the movement of which indicated, by means of a finger rotating on a dial, the number of pounds pressure exerted upon the teeth. The opposing brass teeth were attached to a similar slide moved by a powerful lever worked by hand. When meat was placed between the brass teeth, pressure upon the handle registered upon the dial the force used. The crushing of meat fibres as in chewing was readily recognized, and the force necessary to accomplish it registered accurately. Of course this force would vary with the size of the teeth used, the number covered by the meat at one time, and in a marked degree as the cusps were prominent or much worn off and the surfaces flattened by wear. Tests were also made of various other articles of food, a few vegetables, but especially hard candies, and four or five varieties of nuts. Care was taken to have the extent of biting surface to correspond as nearly as might be with that used upon the gnathodynamometer so that the tests by means of the two instruments might be compared. It is not claimed that the actual conditions of force and resistance existing in the mouth are represented in this way with entire accuracy, but they are sufficiently so to furnish important information relative to the strength and resistance necessary in filling materials and the manner of seating fillings so that they may not be dislodged bodily by the forces likely to be put upon them.

The force required to crush meat fibers between two teeth was found to vary from thirty to eighty pounds, and of beef cut from the neck of an old animal and fried well done, from seventy to ninety pounds, and occasionally as much as one hundred pounds. The tests indicated that in average persons the strength of the jaws is abundant, and more, for the chewing of ordinary meat. Tests were also made of the force required to break a freshly extracted tooth in which it appeared that hard steel applied directly to the point of a cusp would check the enamel at from one hundred to one hundred and thirty-five pounds and the enamel would split off at from one hundred and forty to one hundred and sixty-five pounds or more, but if a piece of vulcanized rubber

were interposed, which was slightly (or more) indented by the teeth no injury was done by a force of from two hundred and fifty to three hundred and fifty pounds, "showing plainly that the teeth may be injured by biting upon the hard metals, pebbles, or other hard substances with the full force of the muscles, or even with much less than the full force in many cases; but upon any substance that will be even slightly indented by the cusps of the teeth, as hard rubber, and in this way increase somewhat the area of the enamel upon which the stress is supported, no exertion of the muscles can injure the tooth."

The determination of the amount and direction of the force used in the sidewise or grinding motions of the jaws proved a more difficult problem and has not yet been satisfactorily worked out, but enough has been learned to show that the grinding motions used in the trituration of starchy foods is more likely to split a tooth or to break away a cusp from the margin of a filling, than the direct closure of the jaws used in chewing meat.

In his third paper, on filling materials, Dr. Black applies the foregoing information to the questions relating to the strength necessary in filling materials. He says:

"If fillings are expected to endure, the material should have sufficient strength to bear without injury the greatest stress the human jaws are able to bring upon it, and continue to do this year after year. * * *

"The stress in the ordinary use of the teeth has been shown to be from sixty to eighty pounds upon the area of two molars of medium size. This, if evenly distributed, would give from seven and a half to ten pounds on a filling occupying one-fourth the area of one of these teeth. This would be a filling of ordinary size, but it frequently happens that a filling must bear all of this stress, and occasionally such fillings must bear all of the stress that the person is capable of exerting. * * * This may be anywhere from one to two hundred pounds, or even a greater stress in some cases. Gold and amalgam are the only filling materials in general use that are supposed to be able to endure this stress continuously."

The third, fourth and part of the fifth in this series of papers describe Dr. Black's experimental work with amalgams, some account of which has been given in the chapter on amalgam.

The tests of gold showed that pure gold, cut from a cast ingot into pieces about one-tenth of an inch in diameter and of similar length (either square or cylindrical) would shorten under a stress of two hundred pounds from about two to five per cent., varying a good deal in different pieces apparently simi-

lar, the average of four blocks being 4.37 per cent. in one case and 2.58 per cent. in another case. If the gold was hammered the shortening was reduced to about one-half of one per cent., but if the hammered gold was annealed the shortening was greater than of similar pieces cut from the cast ingot. Tests were also made of fillings of similar size made by a dozen different operators, most of them making three or four, and some by Dr. Black himself, about fifty in all. These showed a very wide range in weight, or specific gravity, and in strength of resistance to stress. The specific gravity of cast gold is about 19.2, and of hammered gold 19.3 to 19.35. The tested fillings (made in a steel matrix), varied in specific gravity from a maximum of 19.38 in one made with a heavy mallet with the intention to obtain the maximum density, down to as low as 10.7. The shortening under a pressure of two hundred pounds varied from nothing, in those of extreme density, to as much as 32.37 per cent. under one hundred and fifty pounds pressure. These fillings, made in the little steel boxes by many different operators, indicated plainly enough that some men are not in the habit of condensing gold fillings sufficiently to withstand the force of mastication that may sometimes, perhaps often, come upon them. The fillings also showed a wide difference in the closeness of adaptation to the walls and margins and it was not always the case that the densest or hardest fillings showed the best adaptation, though some of them did. Hardness depends almost entirely on the amount of force used in malleting the gold, while closeness of adaptation is chiefly a matter of skill and judgment. These fillings, together with clinical observation of fillings seen in the mouth of patients, seem to justify the opinion that too large a proportion of gold fillings that look well when first made are either condensed so imperfectly as to yield under force of mastication, or so imperfectly adapted to walls or margins as to be spoiled by leakage, and many good operators believe that the discredit of gold for filling teeth by considerable numbers of the dental profession is caused by the very numerous instances of the want of skill or knowledge or patience in those who use it.

The publication of these papers may be fairly considered as opening the way for a step in advance for operative dentistry. The work on amalgam especially indicated what the chief trouble has been with amalgam fillings for the past forty or fifty years, namely, shrinkage to such a degree as to insure leakage sufficient to cause secondary decay in a few years in a vast majority of cases. A small proportion of people were so entirely immune to caries that this did not happen and a small proportion of fillings were made

with amalgams that did not shrink, and these two causes, in the opinion of the writer, will account for most of the instances in which amalgam fillings did service for a long term of years without failure or repair. The work of Dr. Black resulted in putting the manufacture of amalgam alloys upon a scientific basis and a number of manufacturers have since that time been furnishing alloys of uniform and trustworthy character, which do not shrink or expand, or expand only in minutest amount, and which are strong enough to withstand mastication without appreciable change or "flow." The old, and what ought to be considered worthless amalgams, are still largely sold and used. They are more plastic and work more easily, but there is no sufficient excuse for any intelligent man who really desires to make good operations to neglect the amalgam alloys that are honestly made upon scientific principles and each ingot carefully tested. Experience and observation indicate that the average durability of amalgam fillings has very greatly increased in the practice of those men who have for about ten years past been using these good amalgams.

I will quote a paragraph or two about gold fillings from the last paper.

"A careful review of the strength of the fillings presented in this exhibit, together with a review of the article on the force exerted in the closure of the teeth in the June issue of the "Cosmos," will, I think, convince anyone that many of the gold fillings have not strength enough to stand continuously in occlusoproximate surfaces, or in any positions in which they are supported by the cavity walls on two or three sides only. It is doubtful if the weaker ones are strong enough to stand continuously in occlusal cavities where they have the support of four good walls. We should provide, certainly, for a stress of one hundred and fifty pounds on our fillings, and in extreme cases for a greater stress. It is true that in many cases such a stress will not be brought upon fillings, but it is equally true that in the present state of our knowledge of individuals and their habits in mastication, we cannot certainly determine when a weaker filling will be successful. In reasonably favorable cases, gold fillings ought to be made to stand indefinitely. The teeth are strong enough, and the gold can be made strong enough. It can also be perfectly adapted to the walls of the cavities so as to be water-tight, and perfectly exclude the agents that produce caries, and protect the tissues of the tooth.

"A review of the fillings of the exhibit shows a very large per cent of failures to produce fillings that are sufficiently strong. Clinical observation teaches the same thing in terms that seem to me definite and decisive. I would not be understood, however, as placing all failure of fillings at the door of

insufficient condensation. This is only one of many causes of failure. Want of method in the packing of the gold, resulting in imperfect adaptation to the walls of the cavities, leaky fillings, accounts for many failures. Faulty methods in the preparation of cavities are another very large element in the failure of fillings. A large proportion of operators do not give sufficient attention to the position of margins of their cavities with reference to rendering them self cleansing, hence in cases in which there is a strong predisposition to caries, recurrence of decay, with final loss of the fillings will occur, though the fillings may have been otherwise good. Failing fillings are constantly presenting, which upon careful examination prove to have been put in cavities improperly prepared in that the seat of the filling was insufficient to give a sufficient area of gold to support the stress brought upon its occlusal portion in mastication."

The most important results of the experimental work of Dr. Black, described in this series of papers, and which had been laborious in the extreme, consuming a vast amount of time and much money, has been seen in the improved character of amalgam alloys, as already mentioned, and in the greater care and time and intelligent effort bestowed upon the making of amalgam fillings. But the work upon gold and the fillings made in steel matrices by so many different operators, and the defects in them which the various tests made manifest, served as a very useful supplement to the former series of papers on the "Management of the Enamel Margins," and the tests of strength, specific gravity, relative hardness, etc., of the dentine ought by this time to have brought to an end the talk about the teeth that "are too soft to be filled with gold," and about the causative relation of softness of the teeth to their liability to decay or of hardness of the teeth to their immunity from decay. Probably no one doubts that decay, after the enamel has been penetrated, may make more rapid progress in a poorly organized tooth, having large interglobular spaces and generally deficient in lime salts, than in a tooth structurally perfect, but that this "softness" or "hardness" has little or no relation to initial liability or immunity to the beginning of caries, Dr. Black's work seems to have established beyond reasonable question.

INLAYS.

Who made the first inlays this historian has not attempted to discover. They were formally unusual and fancy operations, not having any established standing in the routine of ordinary practice. The "News Letter" for January,

1858, published an article credited to the "American Journal of Dental Science" for July, 1857, in which Dr. A. J. Volk described a method of making an inlay for a labial cavity using a piece of artificial tooth, matched in color and ground to fit the cavity loosely. The cavity was prepared with perpendicular walls and flat bottom (or a flat foundation of filling material). The inlay was wrapped with No. 4 foil wider than its thickness, carefully carried to its place so the gold would go with it to the bottom of the cavity, and the protruding portion packed into the crack, leaving a porcelain surface with a very narrow ring of gold surrounding it, finished with corundum slabs and polished with Arkansas stone. Dr. Volk said the operation had been suggested to him by Professor Maynard of Washington.

At the meeting of the Pennsylvania State Dental Society, in July, 1876 ("Cosmos," Vol. XVIII, p. 486), Dr. B. J. Bing, of Paris, explained his method of filling badly decayed teeth with Hill's stopping and pressing into its surface a plate of pure gold having loops or staples of gold or platinum soldered to the under side. It is carried to its place hot, burnished down to the margins and finished as an ordinary filling. This method was apparently used only for large occlusal cavities.

Prof. Charles Essig, at the meeting of the Pennsylvania Association of Dental Surgeons, in March, 1877 ("Cosmos," Vol. XIX, p. 314), described the application of Dr. Bing's method to large compound cavities by restoring contour in wax, taking impression and model, making die and counter, swaging a cover of pure gold, soldering loops of gold or platinum wire on under side, then packing the cover and cavity with gutta-percha or Hill's stopping, carrying the cover to place hot, correcting articulation by biting on it while the gutta-percha is soft with heat, and burnishing to margins.

These operations cannot be called inlays in the strict sense, but it is noticeable that the plan described by Dr. Essig has been lately in use for making the covers for hollow gold inlays.

At a meeting of the New York Odontological Society in February, 1877, ("Cosmos," Vol. XIX, p. 349-50) Dr. C. E. Francis describes an operation made in a first upper bicuspid having the buccal cusp broken and containing a large gold filling. He ground away the buccal enamel to the gum margin, ground a cuspid tooth to fit, riveted this facing to a strip of platinum, which was fitted round the remains of the tooth, taken off and soldered, making a band. This facing and band were set with oxychloride of zinc, and filled in with gold. He said he had treated many similar cases in the same way and usually with success.

Dr. E. A. Bogue, at the same meeting, said that a young lady came to him with conspicuous cavities in central and lateral incisors. She had had gold fillings removed because of their unsightliness and Hill's stopping substituted. Dr. Bogue ground pieces of porcelain of the right color, carefully fitting them to the cavities, and set them with gum mastic by pressing to place with a hot iron. He wished to know if anyone could tell him how long they would last.

Dr. Hawes, at the same meeting, described grinding porcelain to fit some large labial cavities and setting them with oxychloride of zinc.

Porcelain restorations of central incisors were shown by Dr. C. B. Parker in the clinic of the First District Dental Society of New York. These were pieces of artificial teeth, ground to fit and cemented on, probably with the help of pins. The pulps were alive. ("Cosmos," Vol. XXVIII, p. 426-29, 1886.)

Dr. E. A. Bogue described restoring a bicuspid with the outer cusp broken away from the sulcus to above the gum margin. A cuspid tooth was ground to fit, a bar soldered across the ends of pins and the tooth cut so as to carry this loop (a cross pin tooth) over a projecting point of dentine. The whole was supported with a tight fitting platinum band matrix and filled in carefully with amalgam, the matrix being removed the next day. (Same Vol. pp. 504-5.)

Dr. W. Storer Howe, before describing in detail the grinding, fitting and cementing of circular inlays in labial cavities, enumerates the persons who had previously suggested or described the inlaying of cavities with pieces of porcelain. He says: "It was first suggested by Dr. B. Wood in the "Dental Cosmos" of December, 1862, subsequently Dr. George T. Moffatt, "Cosmos," July, 1869; Dr. C. J. Essig, "Cosmos," May, 1871; Dr. M. H. Webb, "Cosmos," November, 1872, June, 1873, November and December, 1879, and also in May, 1882 (giving credit to Dr. F. Hickman as of date of 1870); Dr. C. H. Mack's patent of 1873; Dr. S. D. Rambo, "Cosmos," April, 1882; Dr. C. H. Land's patent, December, 1887; and Dr. A. H. Thompson, "Western Dental Journal," of May, 1888; all set forth various ways and means by which dental inlaying and partial restoration with pieces of porcelain had been and might be accomplished." ("Cosmos" 1888, Vol. XXX, pp. 542-47.)

Dr. A. H. Thompson read a paper at the twenty-fifth anniversary of the Chicago Dental Society, ("Cosmos," Vol. XXXI, pp. 175-77, in 1889) entitled "Gum-Colored Porcelain Fillings." These were for cervical cavities extending above the enamel line and were made by grinding pieces of gum teeth to fit the cavities and coloring with vermilion the cement with which they were set. In the discussion Dr. Thomas of Des Moines Iowa, said that his method was to burnish thin platinum into the cavity to form a matrix in which the porcelain

was baked. He had such fillings made more than two years previous which were still perfect. Dr. L. L. Davis said he had had opportunities to see many fillings put in by Dr. Land according to the method described by Dr. Thomas, and would not wish to have any such in his mouth or in his practice. In the same volume of "Cosmos," page 353, Dr. J. M. Comegys of St. Albans, Vt., claims to share with Dr. Thompson the honor of using gum colored porcelain for an inlay. He had made it in a platinum matrix with pins in the root and covered the required portion of the porcelain with gum enamel.

Dr. Melotte in the Union convention of the Fifth, Sixth, Seventh and Eighth District Dental Societies of New York, in a discussion on "Porcelain Tips," said that in the "Universal Medical Annual," Volume III, page 564, was an article on this subject by Professor J. Bond Littig, of New York, presenting two methods which are practical, the second of which he had tried in several cases of abraded and atrophied teeth with living pulps. One, a cuspid, was ground off smooth and flat to the extent of the atrophied defects. A cross pin tooth was chosen with thickness a little more than the length of restoration required. With a trephine of the same diameter as the distance between the pins, a circular groove was cut one-sixteenth of an inch in depth. A platinum tube was made of the same diameter, a trifle shorter than the depth of the groove. Slots were cut for the pins, which were shortened to allow the tube to rest against the tooth, and the tube soldered to pins. The tooth, with tube, was placed in position and with pumice stone or corundum and water the piece was rotated till the joint of the piece of tooth with the end of the natural tooth was ground to fit, when the overhang of porcelain was ground away (mostly out of the mouth). Notches were cut in the tube to assist displacement of excess of cement, and set with zinc phosphate, rotating firmly till excess of cement was removed.

At the meeting of the American Dental Association for 1889 ("Cosmos," Vol. XXXI, p. 868), Dr. George L. Curtis of Syracuse, N. Y., read a translation of a paper by Dr. Wilhelm Herbst, of Bremen, Germany, entitled, "Glass as a Filling Material." "Two kinds of glass are necessary; milk glass from a broken lamp globe, and brown glass." These were finely pulverized, washed and dried, several impressions were taken of the cavity and plaster models made. Eight parts of the milk glass were mixed with one part of the brown and wet with water, the models being saturated also. The cavities in the models are filled three-fourths full of the powdered glass, dried with a linen cloth and then heated, after which the glass is melted by a Bunsen burner. Several meltings are usually necessary and the shade can be changed in sub-

sequent melts by adding more or less of either kind of glass necessary. The best of the prepared fillings is selected and cemented into the cavity.

In the "Cosmos," (Vol. XXXII, p. 412, 1890) Dr. S. Davis of Denver, Col., describes four labial inlays cut from porcelain teeth, set with oxyphosphate cement, and the borders then excavated and filled with gold (essentially the Maynard operation). He says he had experience in porcelain inlay work dating from 1868, and had recently seen, in good condition, a large inlay in a central incisor made in this way twenty years previously.

Dr. J. A. Swasey, at a meeting of the American Association, ("Cosmos," Vol. XXXII, p. 884, 1890) after referring to inlays made of rubber, described his method of making a gold inlay. Formerly he took the impression of the cavity in modeling compound and made a model, but lately had taken the impression with ribbon of gold, No. 120, which was then invested in a mixture of coal ashes and plaster and filled by melting gold into it.

Dr. W. H. Metcalf, of New Haven, Conn., at a meeting of the Connecticut Valley Dental Society, ("Cosmos," Vol. XXXIII, pp. 848-51, 1891) described Dr. Herbst's method of making glass fillings, and said it was first demonstrated in America by Dr. Herbst, July 6, 1886, at the S. S. White Depot in New York City. Dr. Metcalf said he thought the entire credit of the introduction of vitreous fillings in teeth should be given to Dr. Herbst. He described the evolution of the method of Dr. Herbst, who at first made them in plaster models, made from modeling compound impressions, then he used gold foil in the cavity under the modeling compound leaving the gold in the plaster model. Afterward he made a matrix of heavy gold foil directly in the cavity, dispensing with the impression and model.

Ancient Inlays.—Dr. Henry Gerhart, of Lewisburgh, Pa, in a letter to the "Cosmos," (Vol. XXXV, p. 461, 1893) says that Professor John G. Owens, of Harvard, told him that while excavating for the Peabody Museum at Copan, Central America, "he uncovered the skeleton of a man of more than ordinary stature. While carefully removing the bones for preservation, he observed the teeth dropping from the upper maxilla and carefully gathered them. On examining a central, he was surprised to find on the labial aspect an inlay of green stone, nearly square, with round corners. Examining its mate, he found that it had also had an inlay, which had dropped out, exposing a red cement which had held it in place; a careful search in the soil brought to light the missing stone."

"Cosmos" (Vol. XXXVII, p. 1037, 1895) contains a paper by W. E. Christensen, D. D. S., of Munich, Germany, read by Dr. Huey before the

Pennsylvania State Dental Society, in which is described, in all essential features, the present method of making inlays by burnishing a matrix of gold or platinum into the cavity and baking porcelain into it, afterward stripping off the metal. He used the Downie porcelains and the Downie gas furnace, but the Custer electric furnace was mentioned in the discussion. Dr. Christensen, for large inlays in molar teeth, advised removing the cement from the surface of the joint with a pointed excavator while soft, or with a small bur after hardening, and filling the narrow groove thus made with amalgam so as to protect the cement.

At the meeting of the Dental Society of the State of New York, in May, 1896, ("Cosmos," Vol. XXXVIII, pp. 693 and 931), Dr. R. Ottolengui reported a correspondence with many European practitioners on the subject of porcelain and glass inlays, and his own experience with them. Letters were read from nine well known practitioners, including the two Davenports, of Paris; Dr. Elliot, of Florence, Italy; Dr. W. E. Royce, of Tunbridge Wells, England; Dr. Wilhelm Sachs, of Breslau, Germany; Dr. William Mitchell, of London, and Dr. Jenkins, of Dresden. With one or two exceptions all these men gave aesthetic reasons as the chief or only ones for preferring porcelain to gold and regarded the operations as of short duration compared with gold fillings, owing to the unreliability of the cement used for setting. Most of them got the most satisfaction out of the ones they ground to fit the cavities, using the porcelain rods made for that purpose, or sometimes pieces of artificial teeth. Those who fused the inlay in a matrix appear to have used glass or low fusing porcelain. This is evident from their using gold for the matrix, though Dr. Webb, of Rome, used a platinum matrix, building the inlay with porcelain bodies. Dr. Ottolengui said: "Dr. Jenkins, of Dresden, writes that he believes that his most recent discoveries in connection with low fusing porcelains bring the work to a high state of perfection, but that until he has tested some of the details of his present method a little longer he prefers not to publish." He adds: "From what I have heard of the work done by Dr. Jenkins I am satisfied that his statement is correct." He also mentions, as original with Dr. Jenkins, the fusing of a bit of blown glass over the finished inlay, "forming a glazed or enamel surface of great beauty." In the discussion, participated in by a number of well known New York men, the fused porcelain or glass inlay had but few friends. Most of those present had seen few or none that were satisfactory. The most approved inlays, in the estimation of most of the speakers, were the old form, made of ground pieces

of porcelain surrounded by a very narrow line of gold to protect the cement, and Dr. Walker said he had seen a great many inlays, but never any that were so satisfactory to him as the work done by his friend, Dr. McKellops, of St. Louis, with gold and platinum foil.

It is evident from such papers and discussions as this that porcelain inlay work developed earlier and more rapidly in Europe than America, in response to a more urgent demand over there for fillings in the front of the mouth less unsightly than gold, and it is also apparent that porcelain fillings had not at that time come into any very extensive use in this country. It is only during the past ten years that the porcelain inlay has gradually won its place as a recognized operation in an ordinary practice.

At the meeting of the New York Odontological Society in January, 1898, ("Cosmos," Vol. XL, p. 360), Dr. Darby demonstrated Dr. Jenkins' system of low fusing porcelain inlays and the discussion which followed, while it brought out forcibly the failure of the glass inlays, showed strong indications that the tide of opinions and practice was turning in favor of porcelain inlays made by fusing in a matrix.

In the "Cosmos" for August, 1898, Dr. N. S. Jenkins, of Dresden, made formal announcement in this country of what he then considered the perfecting of his porcelain enamel and described in detail the process of making inlays with it. He says he had been experimenting for five years before arriving at satisfactory results, which were accomplished in March, 1898. He says: "My practice contains a complete record of the progress of this invention, from fillings which would turn black or gray on the surface, roughen at the edges, and check and crack in every direction, up to those perfect inlays which are unchangeable in color, indestructible in surface, exact in edge, and capable of resisting the force of mastication."

At a meeting of the New York Odontological Society in October, 1898 (Cosmos, Vol. XLI, p. 47), Dr. Walker, of New York, refers to the cementing of the porcelain in the cavities as one of the greatest difficulties in the work, and said there was a dentist in Buda Pesth, Dr. Zsigmondy, who made some of the most beautiful inlays he had ever seen and who never used oxyphosphate or any other cement, but used a transparent varnish, the composition of which Dr. Walker did not know. In the same discussion Dr. Van Woert said he had set three inlays with the Canada balsam varnish opticians use for cementing together lenses of spectacles.

If this manner of setting inlays had proved durable it would probably

have come into general use, but little or nothing has been heard of it for a number of years past.

After the introduction of Dr. Jenkins' low fusing porcelain, and similar ones by a number of other makers soon afterward, there was for several years an animated discussion or controversy as to the relative merits of the high fusing and low fusing porcelains. This discussion has not resulted in any very general agreement or the abandonment of either of them. Each continues to have enthusiastic advocates and a few of the best porcelain workers use both according to circumstances, contending that each has merits which make it superior to the other in certain applications. Most men, however, appear to confine themselves to one form or the other. Dr. N. S. Jenkins, of Dresden, was undoubtedly the pioneer in perfecting and introducing the low fusing porcelain. The high fusing bodies and enamels were preceded by the "Close" body and enamel used for fifty years past for making Dr. John Allen's continuous gum work for sets of artificial teeth. Dr. Land, of Detroit, was one of the earlier ones to adapt and apply these materials to the making of inlays. Dr. Land's attempt to control his materials and processes by patents probably prevented the recognition and encouragement by the profession which he might otherwise have received.

This brief account of inlay work would not be complete without some reference to a few of the men whose enthusiasm and patience have developed it to the present state of comparative perfection and whose papers and discussions in societies and journals have been instrumental in establishing the various forms of inlay operations as standard and recognized practice, to be expected of ordinarily well qualified and up to date practitioners.

Dr. Joseph Head, of Philadelphia, was one of these who was early in the field and presented the subject before many societies. Dr. Capon, of Toronto, was another; Dr. Ottolengui, of New York, a little later perhaps, and in Chicago Dr. W. T. Reeves was one of the earliest to make it a large feature of his practice and has been an enthusiastic and rather extreme advocate of porcelain inlays, using high fusing porcelain exclusively and applying them almost universally in all sorts of cavities in all parts of the mouth. Dr. E. M. S. Fernandez has long been doing most beautiful work of this sort and Dr. J. E. Nyman has often been heard in dental societies upon this topic. Dr. W. V. B. Ames made gold inlays in the '80's and Dr. W. H. Taggart has long been well known as an unusually skillful operator in these lines. The latter gentleman has during the past year presented before several societies a new process for making metal inlays, preferably gold, by casting them under pres-

sure, which promises to be the most satisfactory method of making inlays wherever porcelain is not required. The process in brief is to make a filling in the cavity of wax, prepared for the purpose by filtering or otherwise, so that it will when heated be wholly absorbed into the substance of the mold, leaving no residue. This wax is fitted into the cavity while plastic by heat and carefully trimmed and smoothed to represent accurately the form of the finished filling. It is then removed from the cavity, a sprue attached and the whole enclosed in very fine investment compound that will take a smooth surface and will not shrink, and the wax is melted into the investment.¹ The casting is done by means of an apparatus which provides for the rapid heating of the gold considerably above its melting point, and when ready to fill the mold a tight cover is brought down and pressure applied by means of compressed air, or the pressure from a cylinder of nitrous oxide gas, which is sufficient to exert the necessary pressure to fill the mold, which must be done so completely that the cast inlay will reproduce the form of the wax model to the minutest detail and the sharpest angles.

There must be many men in various parts of the country equally deserving of mention in inlay work, especially in porcelain, as those enumerated. There is not space to extend the list, and the writer has not been able to search through the journals for them.

TREATMENT OF THE DENTAL PULP.²

"The earliest detailed account of the treatment of exposed dental pulps which is contemporaneous with dentistry in this country, occurs in the work of Robert Wooffendale ("Practical Observations on the Human Teeth"), published in London in 1783. Mr. Wooffendale returned to this country in 1795, having been in America previously from 1766 to 1768, and from thence resided with us, part of the time in the practice of dentistry, until his death in 1828; therefore his methods were very probably known and practiced here, at least soon after his second coming among us. Some extracts from his book will be of interest.

"Of the Common Toothache.—This kind of toothache is simply the exposed nerve of the tooth, which gives pain on pressure of food in mastication, on its being touched with any hard substance, the application of anything hot or cold, or the pressure of the atmosphere. When the nerve is exposed, a small bit of lint, dipped in the oil of cinnamon, cloves, turpentine, or any

¹ The heat should be continued till the wax model, which at first may be largely absorbed by the investment, is entirely burned out or volatilized.

² History of Dental and Oral Science in America.

chemical oil, frequently gives relief, and if repeated for sometime, often destroys the nerve. I have known good effects from the application of half a grain of crude opium, rubbed with a few drops of common water to the consistence of a bolus, with the addition of half a grain of camphor brought to the same consistence, introduced into the hollow part of the tooth with a small portion of lint, and repeated daily for eight or ten days. This kind of toothache is sometimes cured by cauterizing the ear. * * * Destroying the exposed nerve of a tooth by the actual cautery is an operation I have sometimes performed with success, and many times without any."

"Benjamin James, in 'A Treatise on the Management of the Teeth,' published in Boston in 1814, recommends, in addition to the opium and camphor of Wooffendale, a drop of either laudanum, oil of mint, or oil of cajeput, placed in the hollow of the tooth."

"Josiah Foster Flagg, in 1822, published a work entitled 'The Family Dentist,' in which, speaking of exposed pulps, and after recommending oil of cloves or oil of cajeput, he says, 'they are also sometimes destroyed by the dentist. * * * by the use of strong mineral acids, or by instruments designed for the purpose.'"

"Koecker, 1826, recommends¹ the attention to diet, and the actual cautery, and stimulates externally with myrrh, camphor, and opium to reduce inflammation of the gums. This author was the first to introduce the operation of 'capping.'"

"Dr. S. S. Fitch, in 1829,² used astringents, as alum, borax, and galls, the application to be renewed every ten or fifteen days for several weeks or even months. He mentions caustic potash as a nerve destroying agent which had then been used."

PULP DESTRUCTION.

³ "We now come to an important year in pulp treatment, 1836. In this year Dr. Shearjashub Spooner gave to the world in his book, 'Guide to Sound Teeth,' etc., the use of the agent arsenious acid for the destroying of tooth-pulps. This practice originated with his brother, J. R. Spooner, of Montreal. Dr. Spooner (Shearjashub) says of it: 'The nerves of the teeth may be certainly and effectually destroyed, with little or no pain to the patient, and without the least danger, by means of a little arsenious acid

¹ Principles of Dental Surgery, London, 1826.

² Dental Surgery, New York, 1829.

³ History of Dental and Oral Science in America.

applied to the nerve;' also: 'So complete and satisfactory is the operation of the arsenic in destroying the living fibre, that, instead of extracting teeth whenever the nerve is badly exposed, we destroy it, plug the teeth, and thus preserve them.' Dr. Spooner employed a mixture of three parts arsenious acid and one part of acetate of morphia. He says 'the twentieth of a grain (arsenic) is quite enough to destroy the nerve of any tooth.' He also mentions nitric acid and nitrate of silver as old remedies, and adds, referring to the actual cautery, 'a hot wire is the remains of barbarism, * * * and does not become the present enlightened day.'"

Chapin A. Harris, in 1839,¹ recommended the "application of leeches to the gum, and soothing and astringent applications to the cavity." He also gives the following formula for application to the pulp, directing it to be introduced on raw cotton and reapplied every day. "Sul. ether, $\frac{3}{4}$ 1; creasote, $\frac{3}{4}$ ss; nutgalls, $\frac{3}{4}$ i; camphor, $\frac{3}{4}$ ss." He adds to the list of these practiced methods, besides those already noted, the use of the drill, and muriatic acid. With regard to the then new employment of arsenic, he remarks that "the fact that this article is a most deadly poison * * * will preclude its use from ever becoming very general." And he names "for the destruction of the nerve in teeth which have but one fang," the use of the drill "as superior to anything that has been heretofore proposed." Notwithstanding the opinion and the warning of so influential a man as Dr. Chapin A. Harris, the use of arsenic for destroying the pulps of teeth did become universal, and it is only recently that the method has been displaced in part by the use of cocaine anaesthesia induced rapidly by means of pressure.

KNOCKING OUT PULPS.

Dr. G. A. Mills (reported in the "Cosmos" Vol. XXV, pp. 447-48, 1883) describes the operation of "knocking out pulps" by driving into the canal a hickory or orange wood stick, slender enough to reach the apex, and dipped in creosote or carbolic acid. A quick blow of the mallet carries the wood to the apex and after a few seconds it may be withdrawn bringing the pulp with it. Dr. Mills testified from his own experience that the pain "was not worthy of notice." (Others who have experienced the operation have described it in much less satisfactory terms.) Dr. Mills discussed the date of the origin of the operation. He said Dr. Atkinson, some twenty years previously (about 1863), had described something similar in preparation for

¹ The Dental Art; A Practical Treatise on Dental Surgery, Baltimore, 1839.

setting a pivot tooth. In answer to the question: Who did it first? Dr. Mills said: "Dr. C. M. Richmond tells me that Dr. George Lawrence, son of Dr. Ambrose Lawrence, of Lowell, Mass., made a practical use of this operation of 'pulp knocking' in the mouth of his brother, Dr. A. S. Richmond, in Chicago, September, 1878, upon a superior central incisor for a crown setting. This practice had been in use by Dr. A. Lawrence for twenty-five years. Who did it before this let some one else answer."

It may be questioned whether "twenty-five years" mentioned above was intended as a definite or only approximate period. It would seem to carry the operation back to about 1853.

Dr. Kennicott, of Chicago,¹ in a discussion in the Western Dental Society meeting in 1856, says he frequently extracted nerves by driving into them a hickory stick, and also sometimes filled the canal permanently with a well fitted hickory plug dipped in creosote. He does not say how long he had used that method.

CAPPING PULPS.

² "Capping or covering an exposed pulp was practiced by D. C. Ambler and others, as early as 1827, but was published to the profession by Koecker, who describes it fully in his work (1826). He used for the purpose a plate of lead, alleging as the reason for the selection of this metal that it had cooling and anti-inflammatory effect on the pulp-substance. If the pulp was wounded he applied actual cautery, placing the cap over the eschar thus formed, and filling the cavity with gold. Upon publication of Koecker's method, it was generally tested and received with favor. Other substances for caps were tried; Fitch used gold,* * * Dr. Harris used no cap but arched his filling over the pulp. Asbestos was early and considerably used as a capping, or for the filling, being prepared with gums or collodion, or rolled in gold foil. Gutta-percha (Hill's stopping), silk, charcoal, paper, quill, tortoise-shell, and horn were experimented with. Dr. N. C. Keep introduced oxychloride of zinc, which, through the advocacy of Dr. W. H. Atkinson and others, has obtained a more extended use than any other material for this purpose." (1876)

At present the oxyphosphate cements, gutta-percha, and oxychloride of zinc are about the only materials used for the covering of exposed pulps under fillings.

¹ News Letter, Vol. X, pp. 4-5.

² History of Dental and Oral Science in America.

"In all methods of capping, the ultimate design is now to secure the production of secondary dentine at the exposed point of the pulp. This object is not apparent in the earlier operations, but was distinctly claimed as the final aim by Dr. W. W. Codman, of Boston, in an article published in the 'Boston Medical and Surgical Journal,' in 1850; since which time this end has been steadily held in view by those who have attempted the operation of capping.

"In 1851 Dr. S. P. Hullihen introduced an operation at once so delicate and scientific that it was immediately incorporated in dental practice and has ever since been known by his name. This operation consisted in 'making a hole through the gum, the outer edge of the alveolar process, and the root of the tooth into the nerve-cavity, and then in opening the blood vessels of the nerve.' ¹ Dr. Hullihen had first practiced this operation in 1845. Drilling into pulp-cavities was not new; for this had been practiced by Hunter and Fox. But they did it to allow the escape of pus; while Hullihen's operation was intended to deplete a congested pulp and allow its preservation. The Hullihen operation was called rhizodontology."

ROOT FILINGS.

In a discussion of this subject at a meeting of the Western Dental Society, reported in the "News Letter," (Vol. X, p. 4, 1856-57), Dr. J. S. Clark, of New Orleans, said he had filled the roots of teeth for nine or ten years. He said the profession knew how far Koecker had carried his operations in this direction, and "Maynard, Hardwood, Badger and Hudson practiced it years before any of us." Dr. Clark filled roots with gold. Dr. Kennicott, of Chicago, in the same discussion, said he frequently extracted the nerve by driving in a piece of hickory wood, and sometimes used a well fitted hickory plug for a permanent stopping for the canal.

The same volume of the "News Letter," pages 234-35, reports a discussion of the questions, "What success has been obtained in fang filling?" and "What is the best manner of filling the fangs of teeth?" Several, among them Drs. Bonsall and Branch, said they had little or no success. Dr. C. W. Spalding, of St. Louis, said he prided himself on his fang fillings. He cleansed the cavity and canal perfectly, wiped out the canal carefully, and filled immediately with gold—"if the fang be healthy the sooner the better."

Dr. J. Taft and Dr. George Watt said they used the same method and had

¹ American Journal of Dental Science, 2nd Series, Vol. III, p. 160.

similar success. Dr. McClelland said he had such success with his fang filling that he considered it a crime to extract a tooth unless there was an abscess.

In the "Cosmos" for October, 1859, Dr. J. Foster Flagg says that his father, after sufficient experience to warrant, about 1850, promulgated the method of using a small portion of cotton and creosote at the apical portion of root canals, the remainder being filled as usual with gold or amalgam—"they were all successful. He had no 'per cent.' in such cases." Dr. Flagg says he had removed such a bit of cotton after nine years and "found it perfectly pure and strongly impregnated with creosote."

The accepted practice at this time and previously appears to have been to use gold for the principal part or the whole of root-canal fillings.

The "Cosmos" for May, 1862, quotes from the "New York Dental Journal" for March an account of a root-filling in a central incisor, found a short time previous in preparing the root for a pivot crown, which had been made by Dr. Hudson, of Philadelphia, presumably twenty-five or thirty years previously. It was in such perfect condition that it was drilled out only far enough for the pivot. This pulp had been destroyed by a red hot wire and the canal filled at once.

There is much evidence that Dr. Hudson was an exceedingly thorough and successful operator with gold as evidenced by the great durability of many of his fillings. This same lady had good gold fillings in other of her front teeth made by him about the same time, when she was seventeen or eighteen years old.

Probably some operators filled the roots of teeth with gutta-percha soon after its introduction to the profession as a stopping for carious cavities. The writer's preceptor was doing so in 1865. For how many years previously he does not know. He used ordinary base-plate gutta-percha, heated in a small porcelain dish over the lamp till very plastic and sticky, and carried into the dry canal with a hot instrument. This made excellent root-fillings in places that could be kept dry and in canals large enough to be successfully filled in that way. Afterward the plan of pumping the canal full of a solution of gutta-percha in chloroform and carrying into it a cone of solid gutta-percha came into very general use and probably more root canals are now being filled in that way than in any other. The method is open to very much the same objections as the use of gold for the same purpose; namely, the gold was occasionally thrust through the foramen, and was seldom packed closely enough, especially in irregularly shaped canals, to prevent the infiltration of fluids. The hard gutta-percha cone is also occasionally thrust through the fora-

men; sometimes the fluid chlora-percha is forced through into the apical space in injurious amount, and the shrinkage by the loss of the chloroform permits the infiltration of fluids around the gutta-percha cone. From the time of its introduction to the profession, there have always been a few men who filled root-canals with oxychloride of zinc. A few also have used the phosphate cements for this purpose. A considerable number use the preparation of gutta-percha known as Hill's stopping, obtaining the necessary plasticity by use of "volatile eucalypti extract," supplemented by heat, churning it into the apical portion of the canal first, and for the remainder carrying in warm Hill's stopping with a hot instrument. The plan is to procure the necessary plasticity as much as possible by means of heat, using only so much of the solvent as may be needful to surely carry the first portion to the apex. This method takes more time, but if skillfully done is very thorough.

Dr. W. D. Miller, of Berlin, read a paper before the World's Columbian Dental Congress, in 1893 ("Cosmos," Vol. XXXV, pp. 803-6), "Concerning Methods Advocated for Obviating the Necessity of Extracting Devitalized Tooth-Pulps." He said no better practice is likely ever to be found than to remove pulp and fill to apex, so far as applied to incisors and cuspids, but when extended to bicuspid and molars, "the labor and expense put it beyond the reach of the great majority of the human race, and the method is not always successful."

"The first systematic attempt to do away entirely with the necessity of extracting the root portions of the pulp," he continues, "appears to have been made by Wetzel, who in 1874 presented the view that arsenious acid carefully applied to the inflamed pulp devitalized only the diseased tissue, and that by amputating the coronal portion twenty-four hours later, the ends of the root-stumps might be treated as healthy, freshly exposed pulps."

Experience proves the expectation that such portions of pulp tissue will remain alive is very seldom realized. As a mummifying agent Dr. Miller first used bichloride of mercury 0.01 of a grain; with boracic acid, 0.02 of a grain; or 0.02 of a grain of common salt instead of boracic acid. This gave severe pain in about one-third of the cases, which led to the substitution of bichloride, 0.0075 of a grain with thymol, 0.0075 of a grain. These were used in the form of tablets, one of which was laid over the canals, moistened with a little water and crushed, covered with a layer of tin or gold foil and the amalgam or cement filling immediately inserted. He mentions several other formulas that he had used.

Dr. Frank Abbott in the discussion said he cleansed canals as well as he

could, and filled with oxychloride of zinc, adding a drop of bichloride, one in 2,000 to the liquid, expecting that this combination would mummify any remnants impossible of removal.

In the "Cosmos" (Vol. XXXVII, p. 921, 1895), Dr. Theodore Soderberg, of Sydney, Australia, in an article on "Pulp Mummification," says that some comments by Dr. W. E. Christensen on the Witzel and Herbst methods of treating devitalized pulps, pointing out that the real effect aimed at by them was the mummification of the pulps left untouched in the root-canals, led him to adopt the method, using the formula of Dr. Wetzel, somewhat modified. Dr. W. D. Miller's paper at the World's Congress led him "to experiment with different pastes to find one which would cause mummification of the pulp without discoloration of the tooth." Several formulas are mentioned, the one he finally adopted being as follows: Dried alum, 51; thymol, 51; zinc oxid, 13; glycerol, q. s. to make stiff paste.

Subsequently other formulas were proposed using formaldehyde as the principal mummifying agent, in combination with thymol and zinc oxid; and in the formula of Professor Boennecken, M. D., D. D. S., of Prague, Bohemia, with the addition to these of cocain.

In discussions of this method in societies in this country it has been strenuously opposed on the ground that it tends to careless and slovenly performance of operations which especially require thoroughness and skill, and also on the ground that success for a time, even for several years, by no means gives such assurance of life long success as may be reasonably expected when pulp canals are well cleaned and solidly filled to the end. The proper field of usefulness for pulp mummification appears to be in the cases where skill and perseverance are unavailing to remove all of the pulp tissue.

An editorial in the "Cosmos," (Vol. XLI, pp. 508-11, 1899) well represents the opinions of the best men in this country at that time. A short quotation will answer our purpose:

"An important feature in relation to the general introduction of mummifying methods of pulp-treatment should not be lost sight of,—viz., the tendency to their careless and indiscriminate use and to encourage slovenly and imperfect operations.

"It is far less difficult to seal a pellet of mummifying paste into a cavity, complete the operation at a short single sitting, and collect the fee upon its completion than it is to do a thorough canal operation, and the very ease which this short cut through an essentially difficult operation to the fee for it confers is a dangerous temptation to degrade the high standard of dental

work which should always be maintained. Unless it can be shown that the mummifying method is something more than a deceptive device for postponing the eventual development of apical disturbances due to ultimate failure of the protective character of the chemical applications to the pulp, it should be undertaken with extreme caution until the records of successful use have carried it beyond the purely experimental stage.

"The view here presented is not intended to be condemnatory of the methods under consideration, nor of the principle upon which they are based, but merely as cautionary against a general adoption of them as methods of routine practice at this stage of their history."

Dr. A. W. Harlan, of Chicago, read a paper on "Pulp-Digestion" before the International Dental Congress at Paris, in 1900 ("Cosmos," Vol. XLII, p. 1272), in which he advocated the use of papain (made from the leaves of the paw paw, or *Carica paya*) for digesting dead pulp tissue. (It has no action on a living pulp.) One grain of papain is made into a thick paste with glycerol and a drop of hydrochloric acid solution, one to 300. "It is best to remove all tissue in sight, and then pack the roots and pulp-chamber full of the paste and seal with oxysulphate or oxyphosphate of zinc, and let it remain without interference five to eight days. In this way the patient suffers no uneasiness, and there is no risk of pericemental irritation. Putrefaction does not take place in the presence of a solution made in glycerol. It is needless to remark that this operation must be done under antiseptic precautions from beginning to finish."

Papain had been previously suggested for this purpose by H. Alexander Francis, in the "Lancet" for July, 1893 ("Cosmos," Vol. XXXVI, p. 249, 1894, "Hints & Queries"). He recommends "papain as a selective caustic because of its known activity as a digester and destroyer of dead and diseased animal matter. It is a powder and non-poisonous. It has been successfully used by insufflation for removing the false membrane of diphtheria; also in the treatment of lupus, and tuberculous ulceration of the vocal cords. The drug possesses properties which seem to indicate a possible usefulness in dental practice for digesting and removing the shreds of pulp tissue after devitalization in tortuous and inaccessible root-canals."

PULP CANAL TREATMENT.

At a clinic of the First District Society of New York, in December, 1886, ("Cosmos," Vol. XXIX, p. 167), Dr. Evans of New York "explained his method of disinfecting devitalized teeth by heat." This he does by "heating a

thick piece of silver to which is attached a thin process, about the size of a broach; the silver bulb gives heat to the broach-like appendage, which is put into the tooth to expel the moisture." When the tooth is thoroughly dried suitable disinfectants are used and the canals filled. This instrument has been extensively used and is known as the Evans root drier. Dr. J. H. Wooley, of Chicago, devised a very similar instrument made of copper instead of silver.

At a clinic of the Odontological Society of Pennsylvania in January, 1888, ("Cosmos," Vol. XXX, p. 269), Dr. H. C. Register dried the root canals of a tooth with compressed air heated to 130°. Dr. Register devised an apparatus for using compressed air, with or without heat, which has been known by his name.

In the "Cosmos" (Vol. XXXV, pp. 22-25, 1893) was published a translation of a paper by Dr. Emil Schwier, of Vienna, in which he advocates a new remedy prepared by himself for the disinfection and cleansing of teeth containing gangrenous pulps. "Its elements are potassium and sodium in metallic form, and prepared in such a manner that it will adhere sufficiently to a barbed nerve broach in small particles * * * The two alkali metals inserted into the root-canal come into contact with a watery liquid. Immediately the well known stormy reaction takes place; the water is decomposed, with the development of considerable heat, by the production of potassium and sodium hydroxid and hydrogen. This latter burns up partly."

The effervescence helps to expel the contents of the canal and the treatment is undoubtedly effective, but has not come into very general use, owing, probably, to the objectionable characteristics of the substances used.

In the "Cosmos" (Vol. XXXVI, p. 329, 1894), is a paper read before the Ohio State Dental Society. Dr. J. R. Callahan, of Cincinnati, described his method of using a twenty to fifty per cent. aqueous solution of sulphuric acid to assist in the enlargement and cleansing of pulp canals, especially those so small as to be impossible for ordinary methods. If very small he places a pellet of cotton saturated with the solution in the pulp chamber, sealing it and leaving for twenty-four or forty-eight hours, after which, or sometimes at the first sitting, the acid solution can be worked into the canals with a fine Donaldson canal cleanser, the acid softening the canal walls sufficiently for the cleanser to cut away enough for the necessary enlargement. The acid will also dispose of any remnants of pulp tissue and thoroughly sterilize the pulp chamber and canals. If the conditions are normal and the apical space healthy the acid will not usually work through the foramen, though if a little should do so it will not create much disturbance. If there is an abscess it

is desirable to force it through the foramen into it. The antiseptic, stimulant and astringent effects are just what is needed in such cases.

Dr. Callahan said he had been using this method for opening, cleansing and sterilizing pulp canals for about four years with great satisfaction. Not very much has recently been published about this method of treatment, but a considerable number at least are making frequent use of it. Dr. Callahan mentioned that the broach or cleanser used with the acid should be discarded after once using as they would be found to break very easily if used at a subsequent sitting.

In a paper on "Immediate root-filling" by J. Smith Dodge, Jr., M. D., D. D. S., of New York, ("Cosmos," 1887, pp. 234-5), says: "This practice may be familiar to others, but it came to my mind as a direct application of Listerian surgery, and I am not aware that any one has adopted it outside of my immediate circle." We have noted that Dr. C. W. Spalding, of St. Louis, in 1856 or 1857, in describing his practice of root-filling used this expression: "If the fang be healthy the sooner the better." He had just been saying that he "cleaned the cavity perfectly, wiped out carefully, and filled immediately, with gold." It appears, therefore, that the practice of immediate root-filling was not so modern as Dr. Dodge seemed to suppose, and it may be remarked that there would not be quite so many claims of novelty in operations described before dental societies if the men who make such claims were better readers of the periodical literature of the profession.

Dr. Dodge limits the practice strictly to teeth having some portion at least of the pulp in each canal living, and he takes the further precaution of sterilizing the canals thoroughly. He filled with a cold cone of Hill's stopping, made plastic and packed with hot instruments.

In the "Cosmos" two months later (June, 1887, pp. 366-67), Dr. C. Edmund Kells, Jr., D. D. S., of New Orleans, commenting on the above article by Dr. Dodge, says: "I believe that dentists all over the country are filling, at one sitting, pulpless roots—roots in all stages of inflammation, as well as those in which the pulps are wholly or partly alive; and not only filling them, but doing so successfully. At the time of learning this method I was fortunately favored with an epidemic of pulpless teeth, and of the first one hundred and thirty cases within two years a careful record was kept, and no failures ensued to my knowledge. This sufficed to convince me of the soundness of the doctrine. Today a root is treated as a simple cavity—cleaned, and filled at once, no matter what its condition. I know of but two exceptions to this rule—one when so much swelling of the face exists as to render oper-

ating impossible; and again when there is so much bleeding through the foramen that too much time is required to stop it.

"If the abscess is caused by the dead pulp, and we remove that, from what source are we to look for further trouble? None."

Quite recently, in 1905 or 1906, Dr. Kells read a paper before the Chicago Odontographic Society upon the same subject and advocating the same practice. It is undoubtedly true that a very large proportion of cases so treated will do well but those who advocate this practice appear to ignore the fact that in all cases of incipient or developed abscess an infectious disease has become established in the apical space which may prove capable of perpetuating itself after the cause that first produced it has been removed. In most cases, if the root is immediately filled, nature will effect a cure, but not always, and while a good many are practicing the immediate filling of all pulpless roots, a large majority of the profession appear to think it a good general rule to see that the disease is cured before discontinuing treatment or supervision and completing the operation.

¹ EXTRACTION AND TRANSPLANTATION.

"The extraction of an aching tooth was, very probably, the first dental operation ever performed, and, for a long time was the principal one; and even as late as 1836, Spooner recommends it as the sole remedy for 'odontitis', periostitis, exostosis, and necrosis."²

"Wooffendale, in 1783, says: ³ 'There are some teeth which it is impossible to draw. This happens when the roots are crooked, or, what the dentist calls locked in the jaw; or when the roots of the double teeth diverge much, which most commonly those of the upper jaw do. * * * It frequently happens that when any of these teeth break in the attempt to extract them, the roots may be gotten out with the greatest ease in a day or two, a week, or a fortnight afterward, though not at the time the tooth breaks.'

"Perhaps the first expression of the opinion that extraction in general is an evil and should be avoided, which occurs in any American dental work, is by L. S. Parmly, in his work on "The Management of the Teeth," Philadelphia, 1819, page 127. He says: 'My experience warrants me in asserting that extraction is much oftener resorted to than is necessary. Whenever a tooth is painful, it is advisable to have it examined, and an endeavor should be

¹ History of Dental and Oral Science in America.

² Guide to Sound Teeth, New York, 1836, pp. 93, 94.

³ Observations on the Teeth, London, 1783, p. 81.

made to remove the malady by palliative means, and if it prove carious the diseased part should be removed and the tooth repaired. Indeed, there is no necessity for having recourse to this dangerous expedient (extraction) even if the crown be entirely decayed; for the fangs of the teeth will always admit of engrafting. Extraction, therefore, can only be necessary either to prevent or remedy irregularity in the arrangement of the permanent teeth of children, or in some diseases of rare occurrence in the adult. * * * In all other cases it is to be opposed, and is a wanton outrage on the unhappy individual who, from the effect of pain, is brought to submit to this harsh and often unavailing measure."

Koecker appears to have had a somewhat different opinion and probably more nearly represents the general judgment of that period, for in his book, published in 1826, he gives to the subject of extracting no less than eighty pages, about one-fifth of the book, and he remarks:

"When we consider the frequent necessity for this operation, and its beneficial effects even only so far as it regards its physical influences, the great importance of it seems to be placed beyond any doubt, and, indeed, on all accounts it must be allowed that there is not an operation in any branch of surgery more worthy of the particular consideration of the liberal minded and scientific surgeon, than extraction."

Koecker mentions the punch, the pelican and the key, and "some pairs of forceps" as the instruments then in general use in extraction. He deprecates the use of the key, says the pelican is almost obsolete, and the punch extremely ill-adapted to its purpose, and adds, in regards to forceps, that those "in common use at present are generally so ill contrived as to be usually applied only for removing loose teeth."

Harris says¹ of the forceps that "until the last seven or eight years they were not very commonly or extensively used, but the improvements that, during this period, have been made in their construction have been so great, that their use has now, with many practitioners, altogether superceded that of the key."

"From about the year 1825 there appears to have grown gradually a feeling in the profession against the indiscriminate extraction so common before (and, to a large extent, after) that period. This date is also that of the general appearance of the idea that teeth should be saved, not extracted.

"The transplantation of teeth is an old operation; but as Hunter was the first and greatest of dental writers to advocate the practice, its origin has

¹ Dental Surgery, Baltimore, 1839, p. 181, et seq.

been ascribed to him." (This is not correct for he refers to it as a well known operation.) "In the earliest days of American dentistry, this operation was considerably in vogue. It was introduced here by Lemaire;¹ who came to this country with the French army in 1781. His advent in Philadelphia is noted by an advertisement (1784) in which he proposes to transplant teeth, and states that he had in the six months previous, 'transplanted successfully 123 teeth.'

"Of Lemaire's practice in this regard we have further accounts. James Gardette, in the 'Philadelphia Medical Recorder,' 1827, says that 'Mr. Lemayeur, with the reputation of an eminent dentist, had transplanted one hundred and seventy teeth in this city, in the course of the winter of the years 1785 and 1786, as he told me himself, at Baltimore, in the fall of the last mentioned year; and that, of all those transplanted teeth not one succeeded. Some became firm, and lasted, but those cases were very rare.'"

After citing many cases of failure in transplantation which had come under his notice, among which were two of John Hunter's and some of his own operating, Mr. Gardette adds: "My opinion, therefore, is that teeth can not be transplanted from one mouth to another so as to answer the intended effect."

"For several years after its introduction, transplantation was a part of the practice of the most prominent American dentists. Replantation * * * was also particularly advocated by Hunter, and has probably had more of success than transplantation. Dr. James Gardette says of it:² 'It has sometimes happened that a dentist has extracted a sound tooth for a bad one. * * * If such a tooth is replaced in its socket immediately after extraction, it will certainly become as firm and useful as ever.

"One phase of Dr. Gardette's replanting practice deserves notice from its then novelty of purpose. He says: 'I have frequently partially extracted and returned to their sockets, small and large molars which had been very painful, after having cut the gum on the side opposite to that on which I intended the tooth to fall in partially extracting it. The purpose of this operation is to separate or rend the nerve asunder, so as to prevent the tooth from giving pain in future; it is then put back into its socket, permitted to become firm, and the cavity is then to be plugged; this I always did with full success.' Dr. Gardette is believed to have been the first to perform this operation."

¹ Watson's Annals of Philadelphia, Vol. I, p. 179.

² American Journal of Dental Science, 1st Series, Vol. X, p. 64.

It is not difficult to understand why the ancient operations of transplanting were so seldom successful. The necessity for aseptic or antiseptic precautions was not then understood, and probably the teeth transplanted did not have the pulps removed and the canals filled. Replanting appears to have been oftener successful, partly, perhaps, because the root of a tooth would fit better when returned to its own socket than if transferred to the socket of another tooth extracted to make a place for it. The success of either operation was evidently very uncertain.

Within the past twenty or thirty years both operations have been revived and another added, namely *implanting*, which means the making of a new socket and implanting a natural tooth in a place where a tooth has been lost for some time, in some cases for many years. So far as the writer knows this latter operation was first brought to the attention of the profession by Dr. Younger, then of San Francisco, since in Chicago, Paris, and other cities. After practicing this operation for some time in San Francisco, Dr. Younger described it at a meeting of the Odontological Society of Chicago and went from Chicago to New York. He made clinical demonstrations of his methods of operating in both places. A suitable natural tooth having been selected, the tooth and the territory in the mouth to be operated upon were sterilized, incisions were made in the gum, but usually no gum was removed, the flaps being needed for the new festoons, a socket was drilled into the bone of the jaw as nearly the size, shape and depth required for the root of the tooth as practicable, the new tooth inserted (of course, having had its pulp removed and the pulp chamber and canal filled) and rigidly fastened to the adjoining teeth. Of course, the most careful aseptic precautions must be observed throughout. A considerable number of men have practiced all three of these operations occasionally. They would be done much oftener if it were not so usual for replanted, transplanted and implanted teeth to be lost in a few years, from six to nine years most commonly, by the absorption of their roots. Probably there may be exceptional cases of longer durability, and the writer has one case which is believed to be doing service now which was implanted about twelve years ago. This is an upper lateral incisor.

Dr. Louis Ottoffy implanted two teeth at a clinic of the Illinois State Dental Society, in 1887, and Dr. W. N. Morrison, of St. Louis, replanted a lower molar at a clinic of the same society a few years later, and all three of these operations are recognized practice, resorted to by many operators when peculiar circumstances and conditions render them especially suitable. They are, however, rare and unusual operations because the cases are rare in which

diseases of the peridental membrane and the alveolus cannot be better treated in some other way than by extracting and replanting the tooth, and the difficulty of obtaining suitable natural teeth in good condition and the reluctance of many patients to have a tooth from the mouth of another person, especially a dead person, transferred to themselves, together with the infrequency of cases exactly suitable for transplanting or implanting, will always render these operations infrequent. It is perhaps worth while to describe one or two cases of unusual success in replanting. The writer's former wife when about eight or ten year old, fell out of a swing and knocked out a central incisor, which fell on the floor of the veranda where she was swinging. She had been forbidden the swing and did not want to be found out so she picked up the tooth and immediately pushed it back into its socket. The root must have been incomplete at the time for it not only was reattached to its socket but the pulp tissues reunited and the tooth had a living pulp at the time of her death at the age of thirty-seven.

Dr. C. S. Case, of Chicago, related a case which was under his observation in Jackson, Mich., of a boy about seven years old who knocked out a half erupted central incisor whose root was not more than half its full length. This lad was brought to a dentist by his mother with the tooth in her hand. In this case the tooth and the socket were simply washed clean and the tooth carefully pushed back to its original position, with only a portion of the crown outside the gum. This pulp reunited, the root was completed, the tooth normally erupted and is now in position with a living pulp, Dr. Case having the young man under frequent observation.

FILING.

¹ "The reasons for the use of the file are given by Wooffendale, in 1783, as follows: ² "Teeth are filed on various accounts, viz.: to remove broken or jagged points, which happen either from accident or decay and are liable to injure the cheek or tongue; to stop the progress of a beginning or advancing caries; to round off the edges of teeth (though not decayed or broken), that grow irregular and prove troublesome to the cheek or tongue; and lastly, for ornament." He adds, "Some universally condemn filing the teeth; on the other hand, some are for having all teeth filed. * * * I apprehend some teeth cannot be filed without being injured by it; others cannot be saved by any other method."

¹ History of Dental and Oral Science in America.

² Practical Observations on the Human Teeth, London, 1783, p. 156.

"Crude as were the above ideas respecting the use of this instrument, they were universally held at the date of Wooffendale's writing. The removal of 'broken or jagged points' and the rounding off 'of edges of teeth that grow irregular and prove troublesome to the cheeks or tongue,' are ideas descended from Celsus.

"Benjamin James (1814) says: ¹ "The sides of the upper teeth lie close together,² while the crowns of the under teeth touch only at that point which is most distant from the gum. For this reason noxious accumulation between the upper teeth cannot be so easily removed as between the lower teeth. It is therefore in the power of the file to destroy the greater aptness of the upper teeth to decay.' Here it is evident that, from saving already decayed teeth, the idea has advanced to the prevention of such decay."

Josiah F. Flagg, in 1822, Fitch, in 1829, and Spooner, in 1836, each gave emphatic disapproval of a too free use of the file, and especially condemned as wholly unjustifiable the filing of sound teeth to prevent decay.

MATRICES AND SEPARATORS.

In a paper in the "Cosmos," (Vol. XXVII, p. 603, 1885) E. T. Darby says:

"Dr. Perry was one of the first to follow Dr. Jarvie in the use of separators, which the latter gentleman introduced to the profession some ten years ago. The new ones which are shown here are improved forms which Dr. Perry has devised after much thought and many experiments."

In the "Cosmos," for April, 1871, (Vol. XIII, p. 169), Dr. Louis Jack, of Philadelphia, describes in detail his method of filling proximal cavities in bicuspid and molars with the help of matrices devised by himself. These were of steel and "made of a variety of shapes, sizes, and thicknesses. They are formed of slightly wedge-shaped pieces of steel, and are hollowed out at their thicker edge, which depression terminates at the thinner edge. At the part of the depression designed to give shape to the buccal edge of the filling the cut is generally abrupt and deep; at the inner portion it is more shallow and more inclined. It will be observed that the depression widens as it passes toward the thinner edge to follow the usual form of proximal cavities. The

¹ A Treatise on the Management of the Human Teeth, Boston, 1814, p. 58.

² This seems to indicate a strangely defective knowledge or observation of the dental anatomy, the fact being that the necks of the upper teeth are separated about as much as those of the lower.—Editor.

lower and thin edge is rounded to outline the curved margin of the cervical wall, and to effect pressure upon either the gum or the appliances used to stop the escape of mucus and blood from this tissue." The "depressions" were shaped with a view to give the proper form to the proximal surface of the filling, and polished. They were expected to extend slightly beyond the margins of the cavity everywhere so that the gold could be perfectly adapted and condensed over them. This required a very considerable variety of forms, sizes and thicknesses. The ends of the matrices were notched so as to be handled with forceps made for the purpose. Some were made with double faces so as to admit of filling adjoining teeth with one matrix, and they were firmly fixed in place by means of boxwood wedges.

For filling in this manner Dr. Jack says: "I use for the upper (cervical) half or more of the filling, ribbons of Nos. 4, 5, or 6, of slightly adhesive gold, but not annealed. These ribbons are made of one-fourth to whole sheets of foil, depending on the size of the space, and then folded into blocks, varied in length by the requirements of the case. For the lower (occlusal) third I prefer rolled gold of No. 20 to 30, of the most adhesive character, and annealed." (The essentials are that the cervical portion be non-cohesive, or very nearly so, and the occlusal portion cohesive). "The instruments for introducing the filling are of simple forms and direct action, but they should be in fine condition,—that is, the points should be well serrated and sharp. The only important modification needed are some pairs of mated pluggers, formed as at Figure 5, in which one side of the edge is considerably longer than the other, which longer side, in malleting, is constantly kept against the matrix; this effects the greatest pressure upon the margins, and secures with positiveness the perfect fullness and proper consolidation of the gold at these parts. Several sizes and varied curves of this point are required."

These forms of pluggers and these matrices were soon manufactured by S. S. White and were sold, more or less, for a good many years. The principal difficulty in their use was to obtain a sufficiently close correspondence of the outline of the depression to the outline of the cavity, and the subsequent introduction of many other forms of matrices led a large proportion of operators to prefer those made of thin and flexible steel bands clamped in position by devices of various sorts.

In a paper read before the First District Dental Society of New York, ("Cosmos," Vol. XXVIII, p. 138, 1886,) Dr. S. H. Guilford, of Philadelphia, says the first band matrix of which he had any knowledge was made by Dr.

Robert Huey, of Philadelphia, "at least a dozen years ago." Dr. Guilford also showed one of his own devising.

At a meeting of the New York Odontological Society, ("Cosmos," Vol. XXVIII, p. 287, 1886,) Dr. T. W. Brophy, of Chicago, showed a band matrix of his own invention, in which the band was tightened by turning a screw which passed through the buccal side of the band against the surface of the tooth, drawing the band away on that side and tightening it on the proximal and lingual sides.

At a meeting of the New York Odontological Society, ("Cosmos," Vol. XXIX, p. 236, 1887,) Dr. S. G. Perry said Dr. Bogue had sent him from Paris the Ladmore Brunton set of matrices, made by Ash & Sons, of London. "The matrix is simply a little band of steel with holes in each end, and so shaped as to pass between the teeth and be caught by little fingers which engage in the holes and are controlled by an adjusting screw. With it comes a very neat watch key wrench, the flexibility of which makes it easy to use in almost any position."

MECHANICAL DEVICES—DRYING MOUTH AND CAVITIES.

¹ "Nothing, perhaps, indicates more accurately the want of thoroughness and attention to detail in the early practice of the dental art than the total obliviousness to all minutiae of operating shown by even the best dental writers of over fifty years ago." (This was written in 1876.)

"It may be stated as a fact that until after the introduction of gold foil, the absence of moisture from the filling was not, as now, considered of great importance. * * * As the manner of insertion was not calculated to prevent the after entrance of moisture around the plug, it will be conceded that its first presence was probably not thought highly objectionable. Koecker, although treating somewhat elaborately (for the time) of the filling operation, says not a word as to the importance of a *dry* cavity. Fitch mentions incidentally the wiping out of cavities with locks of cotton; and so, also, Desirabode." (The raw cotton used at that time absorbed moisture much less freely than the prepared cotton now used. My preceptor, in 1865, bought his cotton in the dry goods store, and it was while a student with him that the dental supply houses began to supply prepared cotton for dental uses. Ed.)

"The napkin was probably the first, and for a long time the only implement used * * * to prevent access of saliva, that already in the cavity

¹ History of Dental and Oral Science in America.

was removed, sometimes by pledgets of cotton, at others by dried and prepared flax, or strips or pellets of linen or cotton cloth. Afterward (1850) Dr. J. B. Rich recommended¹ the employment of tissue and bibulous paper for the same purpose. Even at this date, however, it was held by some that perfect fillings might be made in the presence of moisture.²

"Dr. Dwinelle, of New York, described in 1850 his method of operating with a wax *coffer dam* built up around the tooth.³ In the year mentioned, also, appears the first notice of a saliva collector observed.⁴ In 1854, Dr. R. Arthur devised a 'saliva pump,'⁵ which consisted of a bulbed glass tube terminating in a hollow rubber air-chamber, from which the air was driven by pressure, and the saliva drawn into the tube by the return of the expelled air. * * * The 'latest improvement' in this class of instruments is the 'Fisk ejector,' designed for use where a tap of swiftly running water is convenient." This was made upon the same principle as those now in general use wherever there is a water supply.

"Compressing the orifices of the salivary ducts was early practiced, and 'tongue-holders' were also early in use. That of Dr. Flagg consisted simply of a spoon-shaped metallic plate at the end of a handle held by the patient.' A considerable number, of various forms and modes of action were in common use." (For illustration see "Cosmos" advertisement, July, 1871.)

"In 1856 Dr. Taft introduced the hot air blow-pipe in substantially the same form as now used.⁶

"About 1860 punk came to be used in place of cotton, flax, cloth, or paper pledgets.

"In 1857 Dr. Arthur recommended the use of cross sections of rubber tubing, to be stretched around the tooth where the cavity extended to or below the margin of the gum. The principle of this, however, is found in the previous wax coffer-dam of Dwinelle, and in the use of plaster in the same way."

All these devices, most of which seem now so futile and inadequate, serve to show the desperate difficulties practitioners of those days had to contend against.

"In 1864, Dr. S. C. Barnum, of New York, brought forward the now uni-

¹ American Journal of Dental Science, 2nd Series, Vol. I, p. 61.

² American Journal of Dental Science, 2nd Series, Vol. I, pp. 63, 64.

³ Ibid., p. 65.

⁴ Ibid., p. 65.

⁵ Dental News Letter, Vol. VII, p. 192.

⁶ American Journal of Dental Science, 2nd Series, Vol. VI, p. 555.

versally used rubber dam. The profession was not slow in recognizing its merits, and in 1870 a call for subscriptions to a 'testimonial fund' for the benefit of the inventor was published in the 'Dental Cosmos.' The various societies throughout the country added their offerings to this fund, and their thanks to Dr. Barnum for the benefit he had conferred on the profession



DR. S. C. BARNUM.

through his invention. The matter came before the American Dental Association at its meeting in Nashville, in 1870, and a gold medal, the expense of which was volunteered by three members, was voted him, with a resolution of thanks and the sum of one thousand dollars.¹ The California State Dental Association² presented him a gold medal, and the New York Odontological Society, with members of the Massachusetts Dental Society and others, gave him a gold watch and chain and a sum of money. These acts prove the estimation in which this appliance is held by the profession."

¹ Transactions American Dental Assn., for 1870, pp. 26-27.

² Ibid. for 1873, p. 19.

The "Cosmos" for June, 1887, says Dr. La Roche, of the First District Dental Society of New York, presented affidavit to the effect that he had used a rubber dam as early as 1857, but he did not claim that he had made any effort to make the discovery known to the profession except his own students. This attempt to claim the honors previously given to Dr. Barnum proved entirely futile and brought only condemnation instead, which the profession rightly judged any man to deserve who should discover anything so valuable as the rubber dam and selfishly keep it to himself instead of publishing it for the use of the profession. The rightful and sensible rule in these matters is that the honors belong to the man or men who are first instrumental in bringing something new and valuable into use by the profession.

CUTTING AND DRILLING INSTRUMENTS.

In the early days, before the establishment of dental supply houses, dentists used very few forms of instruments compared to the number used now by every practitioner, and many made their own, or at least repointed them whenever they became worn. I have heard my preceptor say that in his early practice he prepared cavities with a few simple forms of hatchet, hoe and chisel excavators, and hand drills, and filled them (with soft gold foil), using hatchet excavators similar to those used for cutting the cavities, having the cutting edges blunted and smoothed so as to carry the gold forward without cutting it. ¹ "From the straight, chisel-shaped excavator and scaler of old to the modern burring engine is a wide space for progress and evolution; yet there are, in that history, only four divisions or principles of mechanical action to be considered—1, simple hand cutters and drills; 2, automatically, rotating drills driven by hand power; 3, the same driven by foot-power; and 4, the same with the power also automatic."

In the first variety, of hand instruments, there has been a very great increase in the variety of forms and sizes, and what is of more importance, a greater exactness of manufacture, so that now when an instrument becomes worn it can be exactly replaced, either by a new one or by repointing the old. Another "principal difference between the cutters of now and then is in the fact that, where now each instrument is made in one piece, it was then the mode to have each *tool* separate, but all fitting into one handle, which was generally of different material from the implement, as wood, bone, ivory, or mother of pearl. The last two were in the greatest demand, and were often

¹ History of Dental and Oral Science in America.

adorned by elegant carving and even with jewels; and instrument-cases were so made as to exhibit, in all their radiant splendor, the then costly implements of the profession to the wondering gaze of the dazzled patient.

"The scalers were originally of very much more importance than they now are, and bore a much larger numerical proportion to the cutters. It must be remembered that cutting was at first only little attempted—at least in comparison with modern practice—and, when done, a few chisels and spear-shaped drills sufficed for the necessities of the operator and of the case. Nothing so clearly indicates the radical change in modern from ancient dental practice as this difference in the comparative value and number of these two classes of implements."

The above was written in 1876. Since then the increased and successful treatment given to cases of pyorrhoea has resulted in fully restoring the scaling instruments to their former relative importance and if a practitioner of one hundred years ago could see the great variety of forms and the accuracy of their adaptation to the purpose required of them in modern scaling instruments, it would cause him as much astonishment as would the increased number and efficiency of cutting instruments.

"The drill was originally and, for many years, (even in some cases to the present) rotated simply in the fingers and without guards or any mechanism for the protection of the skin. * * * It was not until 1846 that even a partial change in the method of drill handling was introduced. This consisted in the finger ring and drill-socket devised by Dr. A. Westcott.

"The above date, however, does not express a time anterior to the introduction of the *drill-stock*; although, prior to it, this instrument was in use in a crude form, only in isolated instances.

"The first recorded instrument of this character is that of Dr. J. F. Flagg of Boston, which was the simple 'bow-drill' of the watchmaker."

A considerable number and variety of contrivances for rotating drills were brought out before the first dental engine made its appearance. It will suffice to give the names of some of the inventors. Dr. Maynard devised one; Spencer's drill was introduced in 1849, J. D. Chevalier's in 1850, as also that of W. W. H. Thackston.

"In 1858 appeared the greatest improvement until that time in drilling instruments—Merry's drill, the invention of Charles Merry, of St. Louis. * * * The tool-holder and the driving handle were connected by a flexible wound wire."

The development of this "flexible joint coupling" is still in constant use in the engine cables and flexible wrist joints.

"The third division, or class of dental drilling and rotary cutting mechanism commences with G. F. Green's pneumatic engine. This appeared about 1868, and was quite generally used at one time by dentists, especially those of the western states. The apparatus was worked by a foot bellows, the air from which proceeded through a rubber tube to the hand piece, where it propelled certain mechanism which rotated the drill.

"The next to appear on the scene, and the first of the 'standard' class of engines, was the 'Morrison,' about 1870-71. Dr. G. V. Black, then in Jacksonville, Ill., made and used a somewhat similar 'standard' engine, which, however, was not manufactured for sale.

"There are traditional accounts of a pedal engine invented and used by Dr. John B. Beers, of Rochester, N. Y., as far back as 1842. It is said that this engine also worked by a coiled steel universal joint. Of this, however, there are no published records; and it can hardly be justly included in the list of dental appliances, especially as it was never used by any except the inventor. The Morrison was the first offered to the general profession, and was very quickly and widely adopted. For some years it had no dangerous competitor.

"In 1871 was patented Elliot's 'suspension' engine. This apparatus presented entire novelty in all things except the fact of the power being still pedal. The hand-piece and tool-holder, suspended by a cord, which was also the driving cord, by swinging freely in all directions avoided the necessity of a universal joint. The cord was kept tight on the tool-pully by an equalizing weight and wheel, and the pedal and driving-wheel could be in any position."

The suspension engine, in some of its forms, is still used and preferred by many dentists.

"The last, 'but not the least' of the 'standard' engines is the S. S. White. In this the free movement of the hand-piece is obtained by making the whole arm flexible through constructing it of a wire rope of spring temper. At first the strands of the rope were all twisted in one direction; whereby, when hard pressed, ensued what was called 'back lash'—in less technical language, the rope untwisted. This has been obviated by twisting alternate strands in opposite directions, so that the tendency of part of the arm to untwist is counteracted by the counter movement of the other part, thus making the arm, as a whole, perfectly rigid in rotating, while as perfectly flexible in lateral or other directions of bodily movement."

From the time of its introduction the S. S. White engine has probably been more extensively used than any other, and it still represents the standard of excellence in foot-power engines.

"The class of dental engines called above the *fourth* (automatically rotating drills driven by automatic power) is not so, however, in strict order of time of introduction. It is here placed so because it seems naturally the crowning capability to which such apparatus can lay claim, and because the final improvement in engines very probably lies in this direction.

"The first attempt in this direction was made by Mr. G. F. Green, already noticed as the inventor of the pneumatic engine. This gentleman called to his aid electricity. In 1856 he commenced experimenting in this direction, and after some years of effort partially overcame the difficulties encountered, and produced the 'electrical' burring engine."

Few, if any, of these were ever manufactured and sold. Electric motors were then in their infancy, and there was no available source of electric current for power except that generated by a battery on the premises. These difficulties were sufficient to prevent any extensive use of electric power at that early day. Since then the perfecting of electric motors and their manufacture in all sizes and for many uses, together with the almost universal availability of the electric current for light and power, distributed from central stations, have caused electric power to supersede all other for the driving of all dental machinery.

At one time water motors were used with much satisfaction by many who had running water available under sufficient pressure, and one dentist of the writer's acquaintance made for himself a little steam engine which drove his dental engine and laboratory lathe, the exhaust being made noiseless and inoffensive by being carried through a pipe into a pail of water.

FILES, WHEELS, DISKS.

The various forms of cutting and abrasive instruments used with the dental engine have so completely displaced the use of files (except a few forms used by some for finishing fillings) that the modern practitioner finds it difficult to realize the important place once occupied by files in operative dentistry. At a very early time comparatively little attempt was made to treat proximal decays except such as could be removed with a file, fillings being chiefly made in occlusal, buccal, and other readily accessible cavities, and the earlier writings have much to say about filing teeth, usually directions as to the manner and circumstances in which it should be done, nearly all strongly

condemning the indiscriminate and injudicious filing of teeth, and one or two writers opposed its use except in a very few cases.

¹ "The principal early improvements were those of Dr. E. Townsend, of Philadelphia, one of which was designed for the adaptation of pivot crowns to the roots. This was secured by making two companion files, one convex, the other concave, both of the same curve, the former used on the root, the latter on the crown. Dr. Townsend also devised a set of 'finishing files' in the form of a straight or curved smooth central portion (for a handle), carrying at each extremity thin curved, oval, and other shaped file blades.

"Dr. Harris, of Baltimore, in 1833, originated a form of file for the separation of the molars, to avoid the then common use of the file carrier for this purpose.² These were about one and one-half inches in length, shaped like a clock pinion file, and having a handle-like continuation, bent twice so as to form an offset with the hand part projecting beyond.

"The first recorded form of 'file carrier' is that devised by Dr. A. Westcott, of Syracuse.³ In 1848 Mr. J. D. Chevalier introduced another form."

It is not necessary to describe these, and others introduced later. Some held the files by their extremities, like the simple saw frames still in use, others grasped one end of the file and were chiefly used for carrying short broken pieces of ordinary separating files.

"The introduction of wheels or disks into operative dentistry was dependent upon the advent of the burring engine; but the date of first use of revolving cutters cannot be determined" (These were burs and spear-pointed, and flat drills, revolved by the fingers) "Dental wheels and disks probably grew imperceptibly and simultaneously in many hands from the saw burr. The various grinding stones were first used, and were succeeded by the shellac and emery composition, which, in turn, has given way to the corundum wheels of Dr. A. L. Northrup and R. Arthur. A later addition to the list is the disk of W. G. A. Bonvill, a compound of rubber and corundum worked into shape and afterward vulcanized."

Carborundum came into use later and now there are to be had a great variety of forms and sizes, in three or four different grades of fineness, of stones, disks and wheels, and also a great variety of paper and cloth disks, of sand paper, emery, garnet, cuttle-fish, etc., capable of cutting very rapidly or finishing very smoothly as required.

¹ History of Dental and Oral Science in America.

² Harris Dental Dictionary, p. 281.

³ American Journal of Dental Science, 1st Series, Vol. VII, p. 293.

FILLING INSTRUMENTS.¹

"General regard to variations of form, size, purpose or adaptation of filling instruments is a thing of comparatively modern growth. It was thought, even fifty years ago" (this was written in 1876) "that almost any straight, stiff tool was sufficient to the placing of any filling that it would reach, and for those not accessible by such, a curve in the shank quickly made the instrument a proper one. It must be remembered that, at that period, almost the only cavities filled were in the crowns (occlusal) or readily accessible surfaces of teeth. Approximal decay was almost invariably removed by the file, which, of course left no cavity behind it.

"It was believed that much force was necessary in order to properly condense a filling, and the instruments were made correspondingly strong and broad pointed. They were generally entirely without serrations, and with large and strong handles."

All the gold in use at that time was non-cohesive (amalgam had not yet appeared), and tin was inserted in the same manner, and with the same instruments. Wedge-shaped points were used to introduce the filling, crowding it forcibly against all the walls of the cavity, each piece or fold projecting somewhat outside the cavity and when no more could be wedged in the surface was condensed with blunt pointed instruments, and the men of that time were quite right in their belief "that much force was necessary in order to properly condense a filling."

"With the advent of 'sponge' or 'crystal' gold an impetus was given to the invention of new forms of filling instruments. Dr. Dwinelle devised a set for the particular manipulation of this form of gold.

"As the culmination of the idea of necessarily great force in introducing fillings, 'plugging forceps' made their appearance. These were, at first, simple and of limited variety; but they soon took on many forms, and were very extensively used for a time. The most marked variation in them was the swivel fulcrum and changeable points, introduced about 1842.

"An illustration of the extent to which the 'force' idea was carried will be found in the experiments of Dr. J. D. White, as late as 1850, with a 'dynamometer' constructed for the purpose.² This gentleman found that the estimates of dentists in general as to the degree of force used by them in condensing a filling were much too high. Some boasted that they often applied from sixty to eighty pounds pressure on a filling. Dr. White corrected this esti-

¹ History of Dental and Oral Science in America.

² Dental News Letter, Vol. IX, p. 100.

mate by sending his dynamometer to the muscular operator; who, thereupon, found that he had been using only about twenty-five pounds pressure. Dr. White says: 'It is a difficult matter for us to apply more than ten or twelve pounds pressure on a superior molar of a patient of that many years of age, or a nervous and yielding patient. * * * But when we have an older patient, or a hard head and stiff neck, and a molar well set in a well developed jaw, and the patient firmly seated in the chair, we can apply as much as twenty-five, and even, in some cases, thirty pounds.'

"The introduction of cohesive foil rendered necessary a radical change in points in general. This change consisted in the serration of the points, at first, for serration read toothing; for Dr. Arthur recommended 'two or three' points or teeth as being the proper number. These were large and deep in the original forms, but grew smaller and more numerous as experience revealed their frequent breakage and other disadvantages. The points of pluggers, in fact, have gone through the range of intermediate between smooth and blunt, and sharp and single pointed, and back again. * * * The main tendency was from a few deep serrations to a multiplicity of shallow ones, and at this point the majority of the profession now stands."

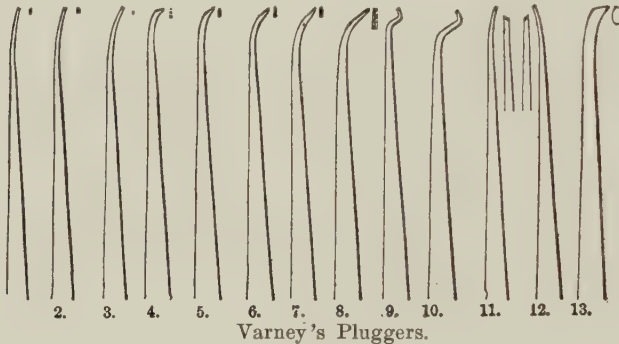
This last, written thirty years ago, has been equally true during all the intervening time. With slight variations there is a recognized standard of depth and distance apart for plugger point serrations, so that the number of serrations depends entirely upon the extent of area in the condensing face of the plugger. About the year 1868 or 1869, Dr. Royal W. Varney produced a set of pluggers in which the size, curves, and temper of each instrument, and the sizes, forms, and angles to the shafts, of the condensing faces, were so perfectly adapted for the packing of the light foils most in use (chiefly number four), that they have maintained their position as a standard set of instruments to the present time and are still used by many operators.

The variety in forms of pluggers has been very great. Perhaps the most important development has been the use of oval faced points by some operators. A set of these made by Dr. E. A. Royce has been extensively used. The idea of an oval face for a plugger point is not recent, for some of the earlier sets, that of Dr. C. R. Butler for one, contained one or more oval faced points, but these were used chiefly for surface condensation or building gold free from cavity margins, while Dr. Royce's set are intended for packing entire fillings.

"The most radical change in the filling of teeth has been wrought by the mallet. The introduction of this instrument has been erroneously ascribed to

Dr. William H. Atkinson, of New York. In fact Dr. Atkinson revived the use of an old and discarded instrument.¹

"Koecker,² writing in 1826, thus expresses his disapprobation of a certain class of operators; 'But what is more surprising and repugnant, after the tooth is thus prepared for the reception of the stopping, some operators actually employ a hammer and punch to drive the metal into the cavity of the tooth. I have seen the most alarming consequences proceed from this barbarous practice, particularly in the cases of several ladies who con-



sulted me in Philadelphia.³ Many of their teeth, especially the incisors, or front teeth and cuspidati, had been plugged in this manner. Some of them had already lost their vitality, and were discolored when I saw them, and others were so tender, from the violence that had been used, that the least pressure upon them caused exquisite pain.'"

It is evident from the above, that if Dr. Atkinson cannot be accorded the primary employment of the mallet, yet he deserves credit for teaching its use in a less "barbarous" manner.

Fitch also (1829),⁴ following Koecker, mentions a case of *splitting* an incisor tooth by the use of the mallet; and concludes by observing that he is "persuaded that no judicious surgeon-den-

¹ History of Dental and Oral Science in America.

² Principles of Dental Surgery, London, 1826, p. 399.

³ As Koecker left Philadelphia in 1822 the use of the mallet in this country is therefore considerably anterior to that date.

⁴ A System of Dental Surgery, New York, 1829, p. 410.



tist will ever adopt this very objectionable mode of performing the operation." The first official recorded explication of the use of the mallet by Dr. Atkinson was in 1861, before the Pennsylvania Association of Dental Surgeons. The editor of the "Transactions" mentions¹ the "entertaining and instructive character of the proceedings" and names as "the principal objection" to its employment "the necessity of always requiring an assistant to use it properly." This objection was soon found to be one of semblance and not of reality. The American Dental Association, at the meeting of 1866, passed a resolution of thanks to Dr. Atkinson "for the introduction of the mallet in dental practice, and for his kind and efficient teachings in its use."² In acknowledging this recognition, Dr. Atkinson referred his first knowledge of the instrument to Dr. E. Meritt, of Pittsburg, in 1838.

"Upon the introduction of the mallet, the attention of dental inventors was immediately turned toward making the principle automatic. Who was the first that presented such an instrument it is exceedingly difficult (and perhaps impossible) now to determine.

"In quick succession (not here exactly given), appeared Foote's, Taylor's, Horne's, Salmon's, and the Snow & Lewis automatic pluggers, all on the spring and (except Horne's) 'touch-blow' principle; Baxter's and Pomroy's, also spring instruments; Bannister's, Green's, and Gaylord's, on the pneumatic principle; Buckingham's, operated by the White dental engine; and the 'electric' mallets of Green, Bonwill, Jack, and Webb. The possibility of such a list was certainly not contemplated by Dr. Koecker when he deprecated the use of the 'hammer and punch.'"

The developments since the above was written have been chiefly in details of construction and perfection of manufacture. The Snow & Lewis still maintains a leading position among the instruments of that class, and the various forms of engine mallets and electric mallets are greatly prized by many of those who use them.

EXTRACTING INSTRUMENTS.³

"The first reasonably complete set of forceps was the work of Dr. J. F. Flagg in 1828.

THE OPERATING CHAIR.

"This important accessory in operative dentistry is (at least as now seen)

¹ Dental Cosmos, Vol. III, p. 258.

² Transactions of the American Dental Assn., 1866, p. 242.

³ History of Dental and Oral Science in America.

a comparatively modern invention. The dental chairs of one hundred, and even of fifty years ago, differed very slightly from the ordinary domestic article, and that difference existed only in isolated instances, the main addition being some provision at the back for the reception of the patient's head. No provision was made for any alteration in height or other position. Many practitioners of early days * * * used an ordinary rocker, which was susceptible at least, of forward and backward movements.¹

"The first chair which provided such necessary conveniences as a head rest, and changes in height and position of the seat and back, was that of M. W. Hanchett, in 1848,² and in the following year another by F. Searle, of Springfield, Mass." (This chair was in use by the writer's preceptor in 1865.)

In 1850, Mr. J. D. Chevalier, of New York, invented and sold a "portable head-rest," for attachment to any ordinary chair. This was not only extremely convenient for itinerants, but it was also perhaps the most complete head-rest then in use. It was susceptible of backward, forward and lateral rotating movements and of being raised or lowered vertically."

From somewhere about 1865 the development of the modern dental operating chair was comparatively rapid, and the Archer, Perkins, Morrison, Harris, O. C. White and other forms are still familiar to many practitioners, and contained very many of the elements which, since the expiration of the numerous patents, have been freely combined to produce the very satisfactory chairs now in general use.

The Perkins chair was supported upon a ball and socket and could be clamped in any position, (raising and lowering being otherwise provided for), but the release of the clamp left the chair free to move to any extent, controlled only by the strength of the operator and the force of gravity, and in a few instances they got beyond the operator's control and precipitated the patients over backward. This, especially in case of a lady, was so very awkward an accident that the possibility of it prevented any very extensive use of an otherwise (for that period) very convenient chair.

Operating Chair. Frontispiece to "Practical Guide to Operations on the Teeth," by James Snell.

"I shall illustrate my notion of a good operating chair by referring to my own. * * * The frame-work should be rather heavy; the feet firmly fastened to the floor; * * * the wood should be the best Spanish mahog-

¹The illustration and description of Dr. Snell's chair, 1832, will serve to show that a few men had made for them chairs with accessories, and capable of movements which made them very fairly suitable for the purposes required of them.

²History of Dental and Oral Science in America, p. 128.

any, rosewood, or some other heavy material, that it may be rendered solid and firm, capable of bearing the parts which are to be attached; the seat should be broad and roomy, at least two feet by twenty inches. This being the most important part will be hereafter described more particularly. The back should be nearly four feet in height, and movable by hinges attached to the lower part of the frame-work of the seat; it should be capable of falling backwards, completely horizontal, or remaining at any angle, which the operator may require.



Operating Chair.

“This latter point is attained by a piece of brass, formed in the segment of a circle, one end being attached to each side of the frame-work of the back board, the other part being made to pass through the post of the arm of the chair. This piece of brass must be perforated with holes, at the distance of an inch from each other; a brass bolt passing through the post and through one of the holes, according to the angle required, will hold the back firmly. The position may be changed in a moment, by the simple removal of the bolt to any other hole, which will enable the operator to place the patient in every variety of position, from the perpendicular to the horizontal. This is particularly useful in cases of sudden fainting.

“At about one foot from the top, the back of the chair should be divided, and made capable of falling down, by hinges. These hinges should be so constructed that their lower parts should not be fixed, but allowed to fall into sockets, so that the upper part of the back may, when required, be removed

altogether. This movable portion of the back should be retained, when put up, by two strong brass snaps, which, by touching a spring attached to each, will allow it readily to fall down. On the left hand side of the chair should be placed a half oval flat cushion, stuffed to the shape of the head, and about a foot in circumference; this is for the patient's head to rest against, and should be capable of being raised or depressed by means of a brass rack or groove, through which the back part of the cushion should traverse, and for which purpose it should be provided with corresponding projections made of brass, the cushion being retained in any situation that may be required by means of a small spring and snap. Another of these flat cushions should be attached to the top of the chair, which should be capable of traversing from right to left, along the upper part of the chair; this upper cushion should also take off and when occasion requires, should be affixed to the lower part of the back of the chair when the upper and movable part which falls down is removed. It should further be capable of moving from or towards the operator.

When the whole back part of the chair is allowed to slope, which is almost always the case in a greater or less degree, the patient being seated, and leaning back, the shoulders alone would touch; the back and loins would therefore be without support. To remedy this, a large cushion should be placed between the patient's back, and the back of the chair; this cushion should be the height of the chair, at that part where it is separated. It should be about twenty inches in length and eighteen inches in breadth. It is requisite that this cushion should be most carefully made; it should be of leather and very exactly stuffed to the shape of the back, that in whatever position the patient may sit or recline, it may be felt equally from the shoulders downward. On the proper shape and stuffing of this cushion depend much of the ease of the patient.

"All patients have not the same length of back; * * * to remedy this, the cushion should be no longer than will be necessary to reach the shoulders of a middle-sized man, and should be flat at the top, to admit of a smaller cushion the length of the breadth of the chair, of a triangular form, the anterior part being rounded. Two or three of these little cushions should be provided of different depths, so that the patient's head may be placed in any position, from the perpendicular to the horizontal.

"Many operations on the upper teeth require that the patient's head should be considerably above the operator. * * * It is desirable, therefore, in such cases, that the seat of the chair should be raised in order that

the head of the patient may be brought to its proper elevation. This may be done by extra cushions; but * * * it is much better to have the seat of the chair capable of being raised by springs placed underneath it. Spiral springs may be so placed as to add very much to the comfort of the seat, and raise the patient at once to a proper height. This is accomplished by the cushion seat working in a rack in the posts of the chair, and being raised or depressed by a small lever under the chair. It is only for the operator, when he would wish the patient to sit lower, to press down the lever, and the little snaps in the rack will retain at the desired point of depression. If, on the contrary, the patient requires elevating, the operator has only to take out the bolts which retain the seat in its depressed situation, and the power of the springs will cause it to rise. It will not be necessary for the patient to quit the chair, except in the case of a very heavy person. * * *

A foot-stool or foot-board is provided, capable of being raised or depressed to any requisite degree of height, while the upper part, upon which rests the feet, is at all times upon the level. This stool is composed of three pieces of mahogany, * * * the lower piece being shaped like an extremely shallow box, and capable of partially retaining the two upper pieces, which lie flat on each other: between each of the pieces is placed a double brass rack, acting in opposite directions. That between the upper and middle board enables the upper one to be elevated; but as this can only be effected at an angle, the front part being higher than the back, a similar rack must be placed between the middle and lower parts, which acts in the opposite direction, by allowing the posterior part to be raised. By this arrangement, the upper surface will, if required, always present a perfect plane, at whatever elevation it may be placed; or * * * it may be depressed or raised at either end. * * *

To give greater firmness to the feet, the upper surface of the foot-stool, at its anterior part, is provided with a triangular piece of wood, upon which the soles of the feet rest agreeably. The upper surface should be covered with soft carpeting. Although this footstool may from the description appear to be complicated, when viewed it will be found extremely simple, the alterations in its position being performed merely by raising or depressing the anterior parts of the upper board. Depressing will raise the back part, as the contrary operation will the front. The stool should be placed on rollers, and should run in two rods attached to the floor, that it may be pushed under the chair when not required."

The British Journal of Dental Science for August, 1859, describes this "New Form of Dental Operating Chair:"

"We have received from Messrs. Ash the accompanying illustration of the new form of dental operating chair, introduced by Mr. Geo. Owen, and described on p. 386, Volume II of this journal.



"In this engraving the seat is represented a little above its lowest position, and the head-piece thrown forward to its fullest extent.

"Messrs. Ash have undertaken to supply the profession with this chair, and enumerate its capabilities as follows:

"1st. There is no machinery whatever below the seat, which has, therefore, a range of from sixteen to eighteen inches, and when at its lowest point it stands about fourteen inches from the floor, corresponding to the height of an ordinary drawing room easy chair.

"2nd. The seat can be raised or lowered with great facility while the patient is seated, and may be adjusted to three-sixteenths of an inch.

"3rd. This great range of motion in the seat being gained, for the most part, in a downward direction, admits of the back of the chair being fixed; its inclination is about thirty-six degrees from the perpendicular, repeated and careful observation having shown that to be, in all cases, the most convenient and the most comfortable for the patient to recline in.

"4th. The head-piece is fixed as to height, the level of it being determined to suit the stature of the purchaser. It can be instantly and easily placed at any angle, one hand only being needed to alter its position, which may be done without interrupting the operation, and it *fixes itself securely, however placed*. In the chair represented by the engraving there are two depressions for the head to rest in, according to the side of the patient on which the operator may require to place himself. This form of head-piece has been found to be extremely convenient, and it is therefore recommended for general adoption, but each dentist can suit his own wishes on this point.

"5th. There is no noise whatever connected necessarily with the working.

"6th. The frame carrying the stuffing that forms the back of the chair and the head-piece is detached by a screw for purposes of cleanliness, and occasionally oiling the spindle, etc.

"7th. The chair is massive, firm and elegant, without being cumbrous, and there is nothing to impede the view of the floor under it, whatever may be the point from which it is seen.

"8th. The cost is about one-third that of any other chair having equal capabilities.

"Connected with the chair are certain appurtenances which remain to be noticed. To the anterior extremity of the right arm is to be affixed a movable table, of about a foot in circumference, capable of being turned in any direction. * * * To the left arm is to be affixed a powerful mirror, also capable of being moved in any direction. * * * In all operations requiring a candle, as in using the actual cautery and metallic cement, it is usual for the patient to hold it in his left hand. * * * Where a light is necessary it is much better to have a lamp, or thick wax light, placed in a branch, the opposite end of which is attached to the left-hand side of the back of the operating chair. This branch should have a sufficient number of joints, that the lights may be placed in any situation, in the front of the mouth, which the operator may require."



H L Ambler

History of Dental Prosthesis

By Henry Lovejoy Ambler, M. S., D. D. S., M. D.,
Cleveland, Ohio

DENTAL prosthesis is the science, art, and esthetics of restoring a lost dental organ or organs and their associated parts with an artificial substitute. Science is the classified knowledge pertaining to the specialty; art is the skillful doing of the work; esthetics is the harmonizing of the restoration, and the case belongs to the prosthetist so soon as an artificial crown is required. The opportunity to create a demand for practical artistic dentures was never better than at present, and the development of artistic prosthesis is in the hands of the dental profession appealing to all, but being accepted by the few who have "learned to love it for its own sake."

In 1847 Desirabode used the term "prosthesis," but up to the present time the nomenclature on the subject is not perfect, still it has been greatly improved in the way of terms, application, pronunciation and definition.

It would be utterly impossible to embody in this article anything like the whole history of dental prosthesis, but a general outlook will be given, and some of the most prominent inventions, improvements, etc., will be noted, often omitting details which can usually be found in text-books.

Numerous authorities have been consulted, and when there has been a difference about certain matters, we have adopted the consensus of opinion, still the few references made here are but an index to the great volume of progress all along the line.

The antique birth, growth and development of dental prosthesis—the mother of longevity—constitutes one of the most interesting and remarkable chapters in dentistry.

"The temple of prosthetic dentistry is composed of stone and pillars which each nation and age has been commissioned to hew and carve. Egyptians,

Grecians, Etrurians and Romans furnished an outline, and modern nations, especially our own, have supplied what was lacking." (Cigrand.)

This branch of dentistry has made great achievements. Let us learn of the past and then judge of the present.

Dental art—more or less—is coæval with the existence of man, but Egypt, the most highly civilized nation of the ancient world, claims the art as a cherished creation, and judging from the existing evidences and specimens of dental art which have been discovered in connection with mummies found in the tombs and catacombs of Egypt, we conclude that practitioners of that time were fairly learned and proficient in dental prosthesis.

Sets of artificial teeth were found carved from wood to fit the roof of the mouth, while the teeth were of brass. In the museums can be seen lancets, forceps, knives, probes and scissors, also specimens of the mode of fastening with gold bands, or ligatures of gold or silver wire, tying the substitute to its neighboring natural tooth.

Belzoni says: "Gold work was understood, as a set of teeth carved from ivory and attached to a gold plate was discovered."

"During life one of the mummies had lost an incisor, and the dentist carved a tooth from ivory and fastened it in place with silk ligatures tied to the adjoining natural teeth. I also discovered bone and wooden teeth. Among the frescoes found at Thebes and Memphis, is one portraying a dentist operating on a patient."

The ancient Hebrews did not have any large amount of mechanical ingenuity, and dentistry with them was in a state of semi-cultivation, but they replaced natural teeth with false ones more than two thousand years ago. A law of the Talmud allowed the women "to go out on the Sabbath with their false golden or silver teeth."

Some rabbis allowed their people "to wear the silver false teeth since these appeared natural, but the use of golden false teeth on the Sabbath was prohibited." Many teeth were made of wood, and later on from the ivory of the elephant's tusk.

CHINA, JAPAN AND SIAM.

The insertion of artificial teeth was practiced in China for ages before it was introduced in Europe; teeth of bone or ivory were sawed and filed to the proper form and fastened to natural teeth by a copper wire, or catgut ligature. If two or more were required, they were made in one block and a hole was drilled the whole length, through which a double string, or wire, was passed which looped over the natural tooth at one end and was tied to a natural tooth

at the other. During mediæval times artificial teeth were seldom worn, as the dentists seemed skillful enough to save the natural teeth, but the Chinese were known to have good teeth.

The ancient Japanese ranked above any barbarian or semi-civilized nation in the practice of dental prosthesis.

One authority gives the following description of Japanese methods:

"A piece of wax large enough to cover the roof of the mouth is heated, introduced, and pushed into position, it is then removed and placed in cold water. Another piece of wax large enough to make the cast, is then heated and applied to the impression, pressed into every part, then chilled in cold water, and separated. A piece of wood is roughly cut to the desired form, and the cast having been smeared over with red paint, is now applied to the plate; where they touch each other is marked by the paint; this part of the wood is cut away, and the process repeated until the plate coats uniformly with the red paint. On the cheap dentures the teeth are merely outlined, but for a better price the teeth are made of stone, shark's teeth, or ivory let into the wood and retained in place by being strung on a string which is secured at each end by a peg driven into a hole. Iron or copper tacks are driven into the ridge to serve for masticating purposes."

Partial dentures were fastened to the adjoining natural teeth by a piece of thread, and used for appearance sake.

The Japanese are very dexterous and admirable workers in all metals. They have made great advances in dentistry. Some of their young men came to the United States to obtain a dental education and then returned home to practice. A few Europeans and Americans are practicing in Japan. There is also a dental college at Tokyo. For several years they have been using artificial teeth made in the United States with special reference to their demands. At first the porcelain teeth manufactured here for the Japanese were black, as they were the fashion established by the women, who after marriage dyed their teeth black by chewing betel nuts and leaves. At present very few black porcelain teeth are used by them, as they are adopting our forms and colors.

The S. S. White Company has an exhibit of artificial teeth, dental tools, etc., illustrating ancient Japanese dentistry, which comprises two hundred and four different articles.

The art of replacing natural with artificial teeth by the natives of Siam was the only thing attempted, in the way of dentistry, up to 1895, in that country. One of the former kings carved and fitted for himself a full set of lower teeth out of the hard shell of a cocoanut.

PHOENICIA, ETRURIA, ROME AND GREECE.

A number of specimens of dental art dating from about 310 B. C., have been found in the tombs of ancient Phoenicia. One of them now in the Louvre at Paris, shows a portion of the upper maxilla where the four incisors and two cuspids were united with gold thread.

"The Etrurians were learned people and skilled mechanics, and they perfected many dental operations, among them crown and bridge-work, specimens of which are in the museum at Corneto, Italy, which were found in the mouth of one of their people entombed more than 2,400 years ago. The artificial teeth were carved from the teeth of some animal, and were fastened to gold bands with rivets passing through each tooth, and the entire bridge held in place with gold bands passing around natural teeth. This bridge consisted of two upper central incisors, and one first bicuspid." (Cigrand.)

"In a tomb built about 600 B. C. were found three teeth bound together with a band of pure gold, and also gold spiral springs. It is certain that dentistry must have been extensively practiced in the early history of the world, and that gold must have been largely used. They generally cremated their dead, thus destroying what would have been a superfluity of dental specimens." (Dr. Van Marter.)

Martial, the Roman poet, who wrote about 80 A. D., says of various prominent Romans:

Lelius was not ashamed to purchase teeth and hair.

"The toothless mouth of Aegle was repaired with bone and ivory.

"Galla removed her teeth at night.

"Thou hast only three teeth and these are of boxwood varnished over."

Cicero in speaking of a law passed to check the unnecessary expense of funerals, says: "Add no gold to the funeral offerings, but whosoever has his teeth bound with gold, let it be no evasion of the law to bury or burn him without it."

A few years ago a rare and interesting discovery was made in a tomb opened near Rome; it was the skeleton of a woman with a complete set of false teeth—on gold—displaying admirable workmanship.

During the time of Celsus and Galen dental prosthesis was practiced among the Romans. Some of the frescoes found in Pompeii depict dentistry in different phases.

The ancient Greeks were skilled in all arts and sciences, and what proof we have of their knowledge of dental prosthesis is mostly found in their liter-

ature, as the majority of the people were cremated, but it is safe to say that they knew about dental prosthesis as early as 500 B. C.

Belzoni says: "The Greeks wore false teeth of sycamore wood which had been fastened to adjoining natural ones by ligatures of gold or silver."

Many cases of crown and bridge-work which were discovered in Egypt, Italy and Greece, were on exhibition at the World's fair in Chicago in 1903.

An Arabian surgeon named Albucasis, about 1100, A. D., was a very skillful "carver of human teeth" and made dentures of bone and ivory, and replaced lost teeth with extracted natural ones. An Arabian general who was slain in battle was identified by his false teeth, which were held in place by gold wedges and wire.

There were several ancient Arabians who were chiefly employed in the manufacture of artificial teeth.

In the sixteenth century skilled jewelers largely cared for the prosthetic branch of dentistry, but late in the seventeenth century this science was put in the hands of men who understood the fundamental principles underlying it.

FRANCE.

Ambroise Paré, who was born in 1517, constructed artificial dentures, having as bases, gold and silver. Hemard manufactured ivory dentures in 1622. In 1728 Fauchard suggested the idea, but did not carry it out, of making artificial teeth out of porcelain. He made use of springs to hold artificial teeth in the mouth, and some claim that he was the first to announce the idea of suction to keep artificial dentures in place. In the above year he published a complete work on the "Art of Dentistry," comprising anatomy, pathology, therapeutics, operative and prosthetic technic. He says:

"I have thought that advantage might be derived from a regular and unalterable coloration from enamel artificially composed. I have also thought that I might from this not only perfectly imitate the enamel of teeth, but the gum, in cases where it is necessary to replace the teeth in whole or in parts of sets. I have consulted the most able enamelers, and by conversations which I have had with them I have rendered practicable that which I believe no one else has ever thought of; the teeth or dentures made of *enamel* will endure a very considerable time since the enamel is a substance scarcely susceptible of change or alteration."

In 1756 Bourdet said that he had "used the pink enamel of Fauchard for gums."

"Hard" porcelain teeth were first invented in 1774 by Duchateau, an apoth-

ecary of St. Germain, and he called the attention of M. Guerard, a manufacturer of porcelain in Paris, to his discovery of a paste which, when baked, became very hard. The latter undertook to manufacture the substance, and with the aid of a dentist, probably De Chemant, produced the first denture of this material. Duchateau communicated his discovery to the Academy of Surgery in 1776, but he did not receive much encouragement.

In 1778 De Chemant says:

"I was induced to reflect on the possibility and means of making teeth and sets of teeth of durable and incorruptible materials. I examined almost all the substances of the mineral kingdom, and at length composed a paste which, when baked (porcelain) had every desirable advantage."

Delabarre says:

"In 1787 De Chemant received from the elder Darcet the idea of coloring the enamel instead of painting. He presented a memorial to the Academy of Surgeons and the Academy of Medicine in 1787, and took out a patent securing to himself the sole right to manufacture mineral teeth for fifteen years."

Desirabode says:

"Fauchard seems to be the inventor of porcelain teeth, then Duchateau improves the manufacture; De Chemant by accident gets hold of the secret, which he further improves and gives as his own in 1788 when he published the first edition of his work. De Chemant carried the art to England where he obtained the exclusive right to work the invention for twelve years."

The fifth edition of "A Dissertation on Artificial Teeth," by De Chemant, published in London in 1816, contains a page of engravings illustrating the various types of dentures which he could supply to his patients. Here is shown a porcelain bridge of ten teeth supported by four pivots, by which it is fastened to roots in the jaw; also full and partial dentures, and a single pivot tooth fastened with silk ligatures.

He draws a parallel between teeth of animal and mineral substances, always deciding in favor of the latter, which were of his own invention. He says: "With my mineral paste lost parts of the bony palate and of the gums may be repaired; also parts of the face which have been disfigured or destroyed." He says he was a surgeon in 1788 and gives the following address: De Chemant, Surgeon, No. 2 Frith street, Soho, London.

"To De Chemant is due the credit of perfecting the invention. He bought the right from Duchateau and then submitted some of the teeth to a committee from the French Academy of Science and they reported favorably; then he, with the assistance of M. Dubois, a dentist, greatly improved the new substance—porcelain."

Audibran and Desirabode are of the opinion that Fauchard was the inventor of mineral teeth, although Audibran is not so positive as to Fauchard having made them, but says he suggested it—if he did not practice it—in 1728.

Foucou decried De Chemant's mineral teeth, but fifteen years later came out in favor of them, and gave to the profession all his recipes, in 1808, to excite emulation, and he has the credit of first making the matter public. He was one of the members of the committee appointed by the Academy of Surgery to report on De Chemant's presentation, and was led to experimenting and finally was rewarded with success. He produced dentures of three principal shades, bluish white, grayish white, and yellowish white, these being of course susceptible to variations in coloring.

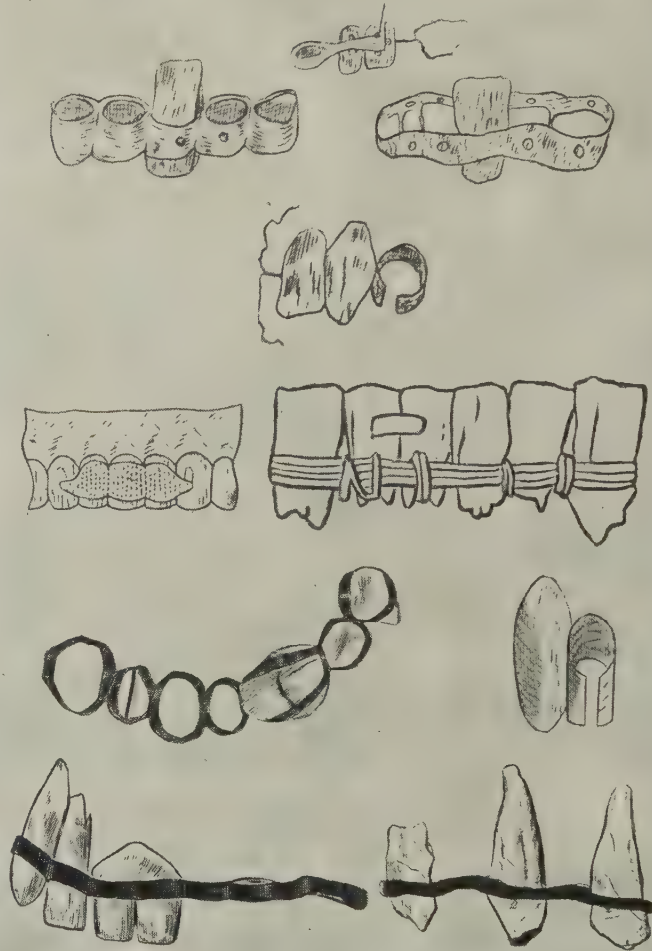
Up to this time the mineral paste or porcelain dentures were made in one piece. The next step was the making of the individual teeth separately, which was first announced by Fonzi in 1808. He also introduced the use of platinum pins, which were placed in the teeth before baking. For these improvements the Atheneum of Art granted to him a medal and crown on March 14, 1808, on the report of M. Fabre, M. D., who was not a dentist. He also received a favorable report from the Academy of Medicine. He called his teeth "terro-metallic," and offered to supply them to his confreres at a just price.

In 1805 Delabarre published "Prosthetic Dentistry," which was probably the first work devoted especially to this subject. It contains forty-two well executed plates.

In 1807 Maggiolo was probably the first to describe in France the methods of taking a wax impression, already described by Purmann of Breslau a century before. He also used rings which he called lateral springs.

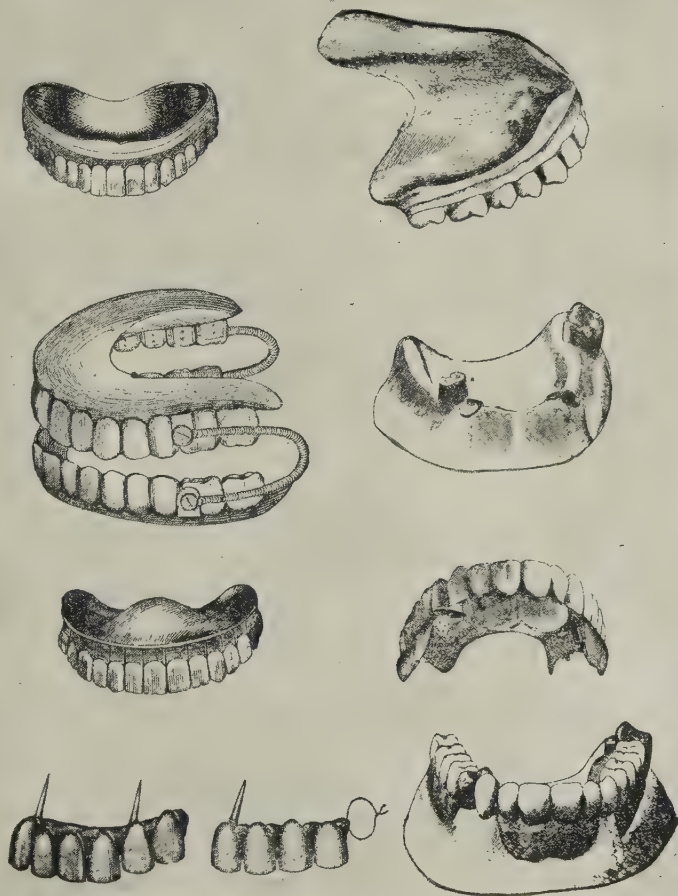
In 1840 Dr. F. Maury says: "Odontotechny is carried to a greater degree of excellence at this present day than it ever attained in former times, particularly in our country where it has become so good and so general as to be considered an art. The materials which have been used in constructing artificial teeth are bones and the teeth of the ox, horse, sheep, stag and other animals; ivory, mother-of-pearl, teeth of the hippopotamus, whale, human teeth and incorruptible teeth made of mineral paste. The femur of the ox was used after being cleansed in clay and exposed to the dew to whiten. If teeth of oxen and horses are used, they should be chosen from old animals because the central cavity is smaller than in the young ones; hence they are more solid and better adapted for the reception of pivots, by which they are to be attached to the artificial base. Partial, and sometimes complete sets are made of ivory which

PLATE I.



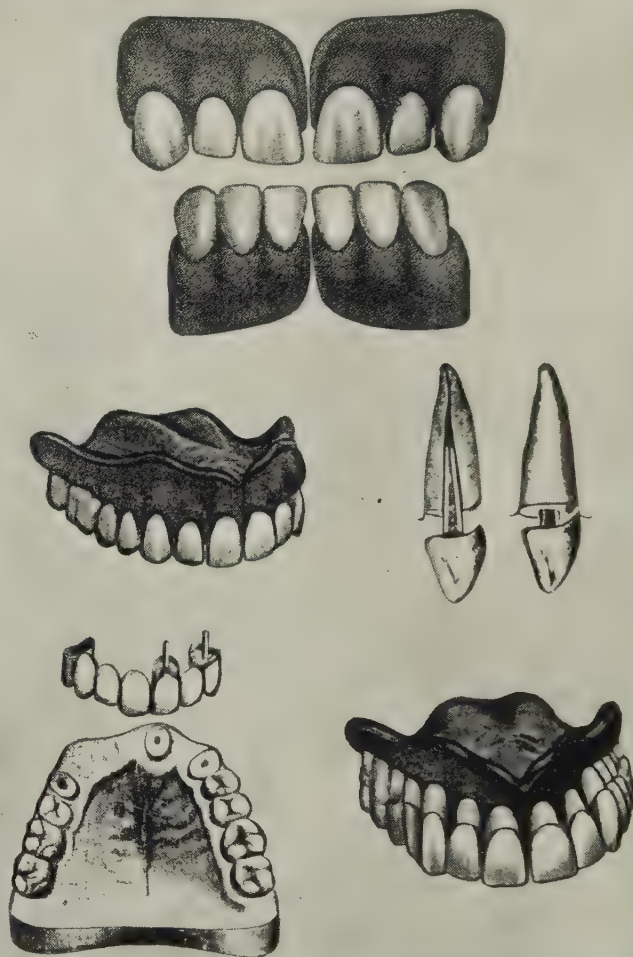
Specimens of Ancient Dental Art.

PLATE II.



Specimens of Medieval Dental Art.

PLATE III.



Specimens of Modern Dental Art.

soon becomes yellow in the mouth and the fluids decompose it. At the present day, the teeth and tusks of the hippopotamus are much used, both with and without enamel; these teeth come from Asia and Africa and are considered the best of any similar material, though they vary much in size, color, form and enamel. When using them or working them, be careful not to expose them to the sun, fire, or a current of air, as they are liable to crack. These teeth sooner or later turn bluish or yellowish. Artificial bases of this material often have human teeth inserted in them. The teeth of the whale are strong but differ very much from the above in form and durability, and are not so much used in dentistry. Human teeth merit the preference and they are generally obtained from the mouths of persons who die in hospitals; they are capable of resisting for a long time the destructive agents to which they are constantly exposed; we prefer the teeth of adults, and should reject all that are not entirely sound; they should be thoroughly cleaned and polished, and immersed in alcohol, then buried in fine clean sand to exclude the air, heat and cold. These teeth can be adjusted on a gold or platina, or mounted on an ivory base by means of platina rivets. Animal substances of which artificial teeth are made are liable to speedy softening and decomposition, and they tarnish and emit a disagreeable odor. We are therefore obliged to renew them frequently. To obviate this inconvenience it has been proposed to manufacture artificial teeth of earth capable of being hardened by heat, and enameled like porcelain. These teeth are called incorruptible."

In 1847 Desirabode says: "To manufacture a complete denture with the teeth and their base, sculptured from a single piece, is decidedly the most difficult piece of dental mechanism that can be made from the tusk of the hippopotamus, for it not only possesses difficulties inherent to the teeth and to their basis, but still more, those which are the result of the union of the two parts.

"Thus the central or great incisors should be broad and flat, particularly those of the upper jaw, which are about a quarter larger than those of the lower jaw; the lateral or smaller incisors should be one-third narrower; the canines more or less rounded, elongated or pointed, according to the person, should be nearly as wide as the lateral incisors. The small molars should be one-fifth smaller than the canines, and the large ones should have a volume equal to the small ones. In order to hollow the tritulating face of the large and small molars some dentists employ a sharp drill. We prefer the engraver, which cuts less circularly.

"Osseous teeth or plates can be colored by boiling in lye, then remove and

wet with a sharp acid, as the solution of tin with hydrochloric acid. Five or six minutes after put it in an earthen vase, placed upon the fire, and containing two and one-half drachms of madder of Kermes, seven grains of crushed cochineal, and a pint of water; boil it a quarter of an hour, then remove and it will have a very deep color; then plunge it in warm soap suds, when it will assume a rose color.

“Mineral teeth are carved by hand or made in copper matrices as nearly as possible in the form of the teeth. A groove on the back of the tooth receives little curved platina cramps which are to form one or more projections above the plane of the teeth, to which are afterwards to be soldered the gold or platina shaft, which serves to mount the tooth. Some put in two or three or four of these cramps, sometimes placed upon the same line, sometimes distributed in equal or unequal numbers on each side of a groove; others curve them outwards in the form of one or two rings destined to receive a little metallic shaft, either vertical or horizontal; others fix to these cramps a little groove, also of metal, which is destined, as the rings described, to give attachment to the metallic shaft upon which the teeth are to be mounted. Some leave these cramps simply at the bottom of the groove in the paste and afterwards solder the shaft upon their external face.

“Mineral teeth are often made to resemble, in all points at least of the crown, the natural teeth; that is, they are furnished behind or interiorly with a talon or heel. This heel is formed in three ways: either by making it continuous with the crown before burning; adding it with a substance of the same nature after it is burnt; or making it with a metallic substance soldered to the cramps of those teeth of which we have just spoken, as being most commonly employed. A tooth with a talon will be found useful in replacing a single tooth, particularly in the lower jaw, because, when mounted on a pivot, they cover the entire root, and then the tongue finds no unpleasant breach, and nothing can get between the root and the artificial tooth. Molars were attached as follows: 1. In each of the sides of the tooth, corresponding to the dental interstices, a depression is made, into which the cramps are fixed. 2. A vertical hole is made which passes nearly up to the surface of the crown; into this passes a pivot fixed to the plate, and through the upper part of this pivot a pin is introduced horizontally through a little hole previously made for this purpose. 3. The tooth is pierced with a horizontal hole, near the top, through which a platina wire is passed and bent down to the plate on each side and soldered. 4. A vertical hole is made entirely through, larger toward the crown than the base; a pivot is fixed to the plate and passed through the hole,

the top of the pivot is capped, and the whole soldered together, thus fixing the tooth.

"Another method was to construct a mineral tooth in form and in the thickness of the projection backward, upon the middle of the upper surface, to make a vertical hole; in this hole are fixed the cramps destined to be soldered to the shaft or pivot which is to fill this hole, or to a little platina tube to receive the shaft. Most of the English teeth are *tube* teeth.

"The paste and enamel of which I make mineral teeth are obtained from the porcelain manufactories of Paris, and I have them burnt in the furnaces of these establishments.

"Impressions are taken with a mass of softened wax molded to the mouth with the fingers, or else the wax is put in a box, a kind of semi-elliptical gutter of tin or silver, upon the anterior part of which is a shaft which forms a handle.

"The impression is filled with plaster, or melted sulphur when about to congeal, and from this model is made metal dies on which the plate is swaged.

"The implantation of a pivot tooth is one of the most common operations of dental prosthesis. We implant one or more pivots in a tooth, either to fix it on a root, or to mount it upon some base. We use gold and platina pins, and metal screw pivots, the latter of which holds the best.

"I mount bone teeth and human teeth upon metal plates.

"The great shoal of the partisans of mineral bases of small dimensions, as of complete bases, is in the shrinkage of the paste (body) which prevents accuracy and which is comparative, compared with that obtainable from metallic or hippopotamus bases. We sought in vain to take the precaution of making the paste one-seventh or eighth, or ninth larger than it is to be; or if definitely fixing its dimensions after it has become dry, as Audibran advises, this difficulty might be diminished but not obviated.

"These bases can only be employed for full sets. De Chemant himself was so struck with the fragility of partial porcelain plates that he renounced them, and preferred to make as many isolated pieces as he had vacancies to fill, except when he held them united by means of a piece traversing the internal part of the dental arch.

"Delabarre mounted mineral teeth with pivots soldered upon a plate; then he furnished the spaces which existed between this and the teeth with porcelain earth moistened, and submitted the piece to the action of the fire.

"Audibran pronounces the most formal condemnation of this work, and Lefoulon says that we are fortunate if we obtain one perfect piece out of six trials.

"Methods of fixing and maintaining artificial dentures in the mouth are: First, by that which we shall call gomphosis, or implantation as pivots; secondly, by coadaptation as cuvettes—plates—simply juxta-placed; thirdly, by compression, as with clasps; fourthly, by attraction, as ligatures; fifthly, by reaction, as springs.

"The method of implanting a pivot in a root are: The seal pivot of Fauchard; the screw pivot of Bourdet; the clacking (like the clasp to a bracelet) tenon of Maggiolo; the subérique pivot furnished with cork by Ricci; the tenon à antennes; the perforated tenon, etc.

"Some are fixed with a screw in the hole in the root, a gold cylinder, of-course hollowed, and screw-shaped in its entire length, within and without; then they place a screw cylinder in the artificial tooth of a diameter equal to that in the root. When the two tubes are arranged, they construct a screw without a head, of a thickness proportioned to the diameter of the cylinders, put the tooth in place, introduce into the cylinder which traverses it the screw which they turn in order to fix it in the root, and the tooth superplaced upon the root has greater stability than in any other procedure."

This method was used by Dumergue, Talma, Maury and Tompson. Desirabode continues:

"As to the precaution that Delabarre takes of fastening the pivot by a transverse peg, introduced between the gum and the root by an *opening* made in this latter by means of a very delicate drill, it is more specious than rational.

"Materials which we have used around pivots, viz.: cotton, thread, hemp, silk, and the substitutes proposed, are amianthus, birch bark, lead, gold and platina in thin leaves wrapped around the pivot.

"Where the canal has been largely destroyed by decay, use two pieces of soft wood cut in the form of a V, so thin that they may be rolled around the pivot, then set the tooth, and the humidity will cause the wood to swell and hold the tooth in place.

"We sometimes in similar cases employ a kind of sealing or cramping, made with the fusible metal of Darcet, with which we fill the canal of the tooth, in order to plunge the pivot in during its fusion; this is particularly applicable to mineral teeth, whose pivot we heat.

In those times many pivot teeth were removed at the patient's will for the purpose of cleansing and then replaced. The author continues:

"Mièl invented an instrument for the removal of broken pivots; it is a small trephine, with a tube in the center for the broken pivot, and whose walls form two branches, and are susceptible of elongation and contraction. The small steel tube terminated by saw teeth, forms a miniature drill.

"In placing four or six pivot teeth it is necessary that the pivot of each should enter its respective dental canal. When the teeth are adjusted and fixed in the mouth, we take the impression of the whole with wax, that they may all come out and remain in it. We then pour upon it enough plaster to maintain them solidly united, then leave it to harden. The wax being removed, we fix a metallic band upon the posterior face of the teeth by soldering.

"We use clasps or branches of platina or better of gold, round or half-round, but most ordinarily plates, whose bent extremities serve to fix to solid teeth artificial pieces to which they are soldered or riveted.

"The writings of Fauchard and Bourdet make no mention of them, and there is nothing said of them in the works printed in the first years of this century.

"Maury said we should give clasps the form of a half circle, and Lefoulon said that the form of clasps varies necessarily, according to the form and disposition of the gums themselves.

"The teeth were sometimes wound with non-putrefying thread where the clasp touched them.

"Delabarre thinks it is better to rivet than to solder clasps to plates, so he sometimes advises us, in order to accomplish this, to make clasps of wire sufficiently strong to admit holes intended to receive the pegs; sometimes he solders the clasp to a small solid plate, which he rivets to the principal plate.

"When the teeth which form the two sides of the vacancy which the piece should fill do not appear solid enough to resist the compression of the clasps, he gives to the branch which carries them a sufficient length in order to permit it to extend behind many teeth until it reaches the one he judges fit for a support; he also uses half-clasps, and small spurs which insinuate themselves in the interdental spaces and prevent all shaking.

"Sometimes clasps are fastened to a plate upon a riveted pivot forming a hinge (as an ear-ring).

"For ligatures we use hemp and linen thread, silk-twist, raw silk, platina or gold wire, and Chinese root which is silk thread impregnated with resinous gum, or Florence hair which is a species of silk taken at the time when the silk-worm is ready to begin to spin, and which we make undergo a preparation. Some surround the tooth with silk before they apply metallic ligatures.

"Some ancient authors, for sustaining dentures in the upper jaw advise fastening them to the gums or bone (Delabarre) with ligatures, but Fauchard condemns the practice.

"Springs applied to double dentures, complete or not, nearly always go in pairs. They fasten from each side to the same places, in order to equilibrate

regularly, and curve from the depth of the mouth in order to accommodate themselves to its concavity. These springs have been made of layers of horn, of bone, or steel; spiral springs, that is springs with cylindrical stems, and contorted upon its middle part; those with double articulated plates, forming a reactor fixed up the side of the dentures, called grasshopper-legs; those with super-placed plates in the manner of a carriage spring, which we had employed before any author had given a description of them; with undulated plate; with simple and double scrolls; but spiral springs are the best.

"Bourdet speaks of them in 1756, and Laforgue, in 1785 pretends they were scarcely known, but they were used before Fauchard's time, as he says: 'We now join two dentures with hinges and springs in the form of a screw, or curved in a spiral manner.'

"In 1803 Lemaitre presented to the Lyceum at Paris a treatise upon these springs, which was accepted as a new and proper invention for extending the limits of art (so say the reporters).

But even if springs are of ancient origin, they have necessarily passed through many forms and improvements before arriving at a state of perfection which has rendered their use so frequent.

"The invention of the method of terminating spiral springs with levers articulating in the middle of each side of the denture belongs to Maggiolo; he had been conducted by the idea that Ricci had of reducing the length of the spiral from three inches to one and one-half inches, and to replace the flexible body with a stiff one.

Maggiolo advised the insertion of the springs "in the middle of the two lines forming the sides of a square, confining the piece in such a manner that it would touch in every direction the sides of this square."

Delabarre says: "Place the articulation of the springs in such a manner that they could not be perceived."

Maury says: "The only precaution we should take to insure success in the use of springs, is to carefully select their true point of support."

Lefoulon says: "It is only by groping that we can find the proper place for the support of the springs."

Fauchard gives a description of a curious machine composed of a complete upper denture, united by springs with a piece of gold or silver which embraces, by means of two half circles, and of two handles, the teeth of the lower jaw.

In making obturators, Ambroise Paré used plates of gold or silver, maintained by a sponge attached to a stem, and Alexander Petronius, who wrote before Paré, said you can stop the hole with wax, cotton, or a gold plate.

The first definite description of an obturator was by Paré, whose first work was published in 1541.

Fauchard and Delabarre also made obturators, the former at one time used ivory, and describes two which he made. One was composed of two central incisors, lateral, cuspid, one molar, with all the part of the upper maxilla in which these teeth were located and implanted, and a portion of the mental apophysis and nearly one-half of the middle anterior plate of the palatine vault; held by ligatures. The other was composed of a plate, stem, two wings, two pivots, a vise, a screw and key.

Desirabode took impressions with wax when he made obturators.

Delestre, a dentist of Paris, in 1845 made an obturator where there was loss of the external table of a portion of the upper maxilla, including many anterior teeth.

There was also the obturator with branches, a shank, a hood 'or drum, a bolt, a wing.

Delabarre and Lefoulon advised making a groove in a natural tooth to keep a ligature or clasp, which was used to hold an obturator from slipping.

The names of Le Blanc, Quesnay, Descault, Dupuytren and Preterre are closely associated with obturators.

In cases of hair-lip and separation of the palatine bones, Roux attempted the *compression* of the dental arches from *without inwardly*, and Levret and Autenrieth did the same.

Vidal de Cassis says: "We may aid nature by a compressive bandage acting under the two cheek-bones, or by *metallic wires traversing the palatine vault, and binding the molars on the opposite side.*"

This was Jourdain's method, only he used silk ligatures instead of wires. *He exerted a double traction in contrary directions upon the two ranges of molar teeth.*

Lefoulon, in 1844, and Maury used a band with an occlusal surface soldered to it.

Another method was to envelop the anterior part of the upper alveolar arch in an elastic steel band, which was maintained by two metallic springs around the cranium. This band had two branches which were furnished with leather or india rubber. These operated by the continuous reaction of the leather or rubber aided by the action of the lips and by means of two compressed cushions against the jaws.

It should be said that all branches of modern dentistry in France are very similar to what we find in England and the United States.

ENGLAND.

In 1600 the "Manchester Times" tells about the parson who could not preach on the Lord's day because he had sent his artificial teeth up to London to be repaired, and they had not been returned.

In 1709 "Stationers Hall Sheet" contained an advertisement, viz.: "Sets of teeth set in so well as to eat withal and be worn years undiscovered. John Watts, Operator."

In 1769 an advertisement reads: "M. Hamilton, Surgeon Dentist and Operator for the teeth from London, cleans and beautifies the teeth and makes artificial teeth, from a single tooth to a whole set."

Berdmore, of London, in 1770, says: "Crowns of human teeth are set on natural roots with a pivot, or rivet, or screw.

"Teeth of bone and ivory are the most desirable.

"Ligatures for holding in artificial teeth are of silk or wire.

"Springs are used for holding full sets of teeth.

"Gum color is applied to a set of carved artificial teeth."

Fuller of London, in 1810, says: "The construction of artificial teeth is now brought to great simplicity and perfection. Natural teeth are pivoted on roots. Full sets are made of human teeth on a base of bone, gold or silver. Partial sets are held by ligatures of silk, or gold springs.

"When the whole of the upper teeth are gone, if the artificial piece is fitted very accurately so as to accommodate every rising and depression of the gums, persons often may wear such a row by its *adhesion* to the gums, which it will form in a very considerable degree, when it is moist and the contact is complete, but when this cannot be done the teeth can be held in with springs.

"When all the lower teeth are gone they do not require any fastening, as they rest on their own proper base.

"Hippopotamus tusk is the best to carve teeth from.

"Keep your natural and artificial teeth very clean by the use of antiseptics, and have two sets of artificial teeth, so as to be prepared for accident."

Clark, in his book on "Natural and Artificial Teeth," published in London, in 1826, says: "Human teeth were first used as substitutes for lost teeth; next the teeth were made of bone and tied with ligatures. In particular cases the sockets are formed of gold adapted to the shape of the gums, on which are fastened natural teeth in front, and bone substitutes for the back teeth. Now artificial teeth can be pivoted to stumps, or attached to the adjoining teeth, by means of gold claws or springs, or ligatures, but they can be put in without

these by using a fine gold spring about like a *hair* contrived to go half way around the adjacent natural teeth."

James Snell, of London, in 1832, gives a method of fastening loose natural teeth with gold caps soldered to a gold plate which fits the back part of several teeth.

Nicholles, of London, in 1834, says: "Of all kinds, the *mineral teeth* are most objectionable; human teeth or ivory are the best, and hippopotamus tusk or gold are the best bases."

L. Charles De Loude of London, in 1840, says: "Wax is used for impressions which are poured with plaster and from the cast dies are made for gold or platina plates, or else the base is made of hippopotamus tusk and then the ivory teeth are attached by rivets or screws, then holes are drilled in certain places and ligatures put through and tied to the natural teeth; or clasps of gold riveted to the ivory go around some natural teeth so as to keep the artificial teeth in the mouth.

"Some partial sets and some whole upper rows can be held in by *atmospheric pressure* and *capillary attraction*.

"Pivot teeth are applicable to the six front teeth of the upper jaw, and if any portion of the crown is left it should be sawed off and not cut off with nippers as they might split the root, then file the end of the root to suit, and enlarge the canal and treat with *silver nitrate* and set with a gold pivot.

"Human teeth are generally used for pivoting, but if the dentist understands the management of mineral teeth they are very much better.

"Some use hickory for pivots in place of gold or platina.

"The adoption of mineral teeth and gold plates stands pre-eminent, and during the last twenty years these teeth have been made with wonderful improvements in France, England, and the United States of superior beauty and durability and of every color and shade.

"Gold pivots are soldered to each mineral tooth, then they are put into holes on the gold plates where they are soldered.

"Some mineral teeth made by Billar, of Paris, have eyes to their backs, like the eye of a button; they have a preference in working as the pivots can all be soldered to the plate, and the teeth afterwards fitted and soldered together.

"Molars can be made of *gold* either *solid* or *hollow*, and then soldered to the plate of gold or platina, as I made some in 1836.

"For impressions I use wax in tin cups or shapes, the whole size of the upper and lower jaw, or right and left, *half jaws* and *fronts*.

"The impression is poured with plaster and the model is sent to a brass-

founder to have a similar one made of brass; after which a *she-mold* is made of lead on the one of brass, then plates of gold, silver or platina are swaged."

Goddard, of London, in 1844 says: "I use only mineral teeth purchased of Ash in this city, and of White, Stockton, Alcock, and Ambler in the United States."

He uses wax for taking impressions, and gives a method of carving, molding, baking, setting and pivoting.

His book contains many plates illustrating his methods.

In "Artificial Teeth," written by Tomes, of London, in 1851, appears the following:

"The base for mounting artificial teeth is sheet gold or ivory. Wax for impressions is used in a tray, and the impression is poured with plaster. In 1846 a mixture was patented, of what looked like hard sealing-wax, and this was used for a cheap base in mounting teeth."

Tomes gives the technic for gold and ivory bases, the latter can be *carved by a patent machine* which he invented, thus doing away with hand carving and the use of pigment. He continues:

"Human teeth, ivory and mineral teeth are used, and in full cases atmospheric pressure is adopted.

"For attaching teeth to plates, pins are soldered to the plates and the teeth cemented on, or the end of the pin is headed down.

"The new form of spiral springs has a *double curve*, and they are used when a full upper and lower denture is required.

"Bands, around teeth, which are soldered or riveted to plates are quite useful."

Fox and Harris, of the United States and London, in 1855, say: "Artificial teeth are commonly made of hippopotamus tusk. Still of late years they have been made of porcelain, and they are fastened to adjoining teeth with ligatures of silk, Indian weed (silk-worm gut), gold wire, or gold springs.

"Human teeth are set on natural roots with a pivot of gold wire, and natural teeth are fixed to a gold base, or base of ivory.

"The perfection in which porcelain teeth have been manufactured during the last ten years, especially in the United States, has secured for them a decided preference, and one establishment there has sold about \$25,000 worth annually. These teeth are used in Great Britain, France, and other foreign countries. Still many porcelain teeth are made in London by Mr. Ash.

"As a general rule, the roots of the superior incisors and cuspidati are the only ones capable of affording a firm support to pivot teeth.

"Plates of gold can be fastened to natural teeth with clasps.

"Spiral springs are only used when all the teeth have been lost in both jaws.

"Artificial teeth may be confined in the mouth by *atmospheric* pressure and *capillary* attraction, and lower plates on this principle should be made to reach up on the coronoid process.

"In setting pivot teeth sometimes the root canal is filled with red cedar with a perforation in the center, into which a metallic pivot, soldered to an artificial tooth, is forced.

"Hollow gold tubes with screws cut on the upper extremity are used, filling around the lower part of the tube with gold foil to hold it securely, then the tooth is set with a compressed hickory pivot.

"When a tooth is pivoted in a root from which there is a fetid discharge, an outlet for the escape of the matter should be provided by cutting a groove on the side of the pivot—as recommended by Dr. L. S. Parmly—or by the employment of a tubed pivot with an opening through the crown of the tooth opposite to the pivot-hole, as proposed by Dr. E. H. Elliott; this is unscientific but sometimes necessary.

"Wax in a box or frame is used for taking impressions, which are poured with plaster, and afterwards dies are made.

"Dr. Elliot, of Plattsburg, N. Y., says: 'Frames should be made by swaging between a model and counter model, in the same manner that a gum plate is fitted to the mouth.'

"Partial cases have clasps soldered to them, and teeth are backed and soldered to plates.

"Double sets of artificial teeth can be retained with spiral springs."

Fox also writes about artificial palates and obturators, gives Delabarre's method, and advises that when recourse is had to mechanical means as a substitute for the absence of any portion of the roof of the mouth or palate, it should not be until after the completion of the growth of the jaws. He describes the obturators of Ballif, Paré, Gariot and Bourdet, and also obturators attached to artificial teeth on plates, such as those of Fauchard.

Snell, of London, in 1823, published a work on "Artificial Vela," and in 1828 one on "Obturators."

Mr. George Parkinson, of London, made artificial vela in 1867.

"Loss of the Teeth," by Thomas Howard, of London, in 1860, shows mineral teeth set in soft flexible corallite gums; also a partial set of the same material, sustained by self-adhesion or capillary attraction. Howard says:

"Teeth made of hippopotamus tusk feel congenial to the mouth, and cannot be distinguished by the tongue from the natural gum and teeth, and being

fitted and adhering to the gum only, afford support to the remaining teeth, which are let into grooves formed in the piece for their reception.

"This prevents toothache and other painful sensations, by shielding tender teeth and stumps from change of temperature and extraneous matters.

"I can make artificial teeth without extracting any teeth or stumps, which will give perfect satisfaction.

"I have invented a new description of composition teeth, composed of silicious substances with a very fine enamel upon them, and can match any natural tooth; their durability is unbounded and they will never decay or discolor."

R. P. Lennox, of London, in 1897, tells about vulcanite and gold plate work, and uses springs when necessary; he cemented tube teeth to gold plates, and also used them for vulcanite plates, and says that Ash's mineral teeth have been on the market about sixty years; he also treats of crown and bridge-work.

In an article by T. Tanner, published in 1907 in the "Dental Record" of London, appears the following:

"All the arts have made rapid progress during the past century, and mechanical dentistry, an art that requires much ingenuity combined with the most delicate power of manipulation and refined taste, an art which is so conducive to the health, comfort and happiness of mankind, has progressed in a like manner, and proved itself worthy to take its stand side by side with the most useful, liberal and honored professions. At the beginning of the last century, mechanical dentistry may be said to have been comparatively in its infancy; at all events, the many improvements which have been made since and introduced, and the changes in method which have taken place, warrant us in coming to this conclusion. At this early period the material made use of in the construction of artificial dentures was the ivory of the elephant, walrus and hippopotamus. After a time it was found that gold was an excellent basis on which to set natural and ivory teeth, so that this metal came into general use and it continues to be one of the most useful bases for mounting every description of teeth.

"In 1811 Mr. Heath, a London dentist, invented a new mineral compound which was semi-transparent, natural in color and artistically carved into teeth, gums and blocks.

"In 1829 Mr. Hallet, a Scotchman, who had been some years in America, came to England and taught his process of making mineral pieces.

"Mr. Wilson (then of Paris) introduced a half tooth, which had platina slips sunk into a central groove for attachment of gold backs.

"In 1830 Mr. Berrend, of Liverpool, brought out teeth differing in shape

from those mentioned; they were half teeth with platina pins, but more natural in shape and of a variety of shades.

"In 1833 Mr. Hogue, of Edinburgh, invented a tooth with half round tubes, which prevented them from rotating on their pivots.

"In 1836 Mr. Lemale, of London, introduced his mineral teeth, as did also Messrs. Ash in 1838, to whom we are indebted for teeth with gold tubes.

"Continuous-gum work has been and is now used by some.

"About 1847 Mr. Harrington, of London, exhibited a method of compressing tortoise shell into a formation for the reception of mineral teeth. He obtained a patent on its use, but it was finally abandoned.

"About this time Mr. Bartlett made experiments for the compression of buffalo horn into the required form of sockets for reception of teeth, but it was soon discontinued.

"Mr. Truman, of London, was the first to use gutta-percha for dental plates.

"About 1857 Dr. Blandy, of America, introduced his cheoplastic work here, but it was not much used.

"In 1843 Mr. Handcock patented 'A process for hardening a compound of India-rubber by steam heat, and molding it into various forms for use in the Arts, Sciences or Manufactures,' but to Mr. Goodyear we are indebted for the idea of applying it to dental purposes, and through Dr. Putnam, of New York, it was introduced into this country.

"Vulcanite has been improved in color but not in quality; it has now taken a high place in our laboratories and is quite generally used.

"Celluloid has been used somewhat, but has generally been abandoned.

"Pivot teeth were first set with a wooden pivot, but this gave place to pivots made with tube teeth or flat teeth with gold backs and wires, the wires having a thread cut on them; the root canal was filled with hickory, and the wire screwed into it.

"This method gave place to metal tubes, either platina or alloy which were fitted into the root canal and the wire pivot inserted in the tube.

"Mr. Balkwill screws a metal tube into the root canal and sets the tooth with a split pin.

"In crowning back teeth I use the crowns of Balkwill, Bonwill, and Logan, or an all gold crown or a porcelain faced gold crown. There are various ways of making bridge-work, but personally I have not much faith in it, except for small pieces."

Parreidt, of Leipzig, in 1889, says:

"An impression material composed of isinglass, madder, stearic acid, oleic acid, and copal (Stent's composition), and also plaster, is used for taking im-

pressions; from the impression get a plaster model, then make dies for gold or platinum work.

"Spence metal can be poured directly into the impression if so desired.

"Vulcanite is used as a base for artificial teeth.

"The dentist can manufacture the porcelain gum, but the teeth he purchases, or gums may be represented by pink rubber.

"Incisors or cuspids can be replaced by artificial crowns to which a pin is attached; they are fastened into the roots; such pivot teeth seldom cause inconvenience.

"When roots are missing or where a large number of teeth are inserted, they are attached to a plate that covers the alveolar process, and in the upper jaw the palate also. To these plates clasps are sometimes attached, which are clasped to the firm natural teeth to thus assist in retention of the plate, but the use of clasps has been largely discontinued.

"In full cases suction plates are used; in partial cases suction is not always sufficient.

"Spiral springs may be resorted to if suction plates do not give satisfaction.

"Ten years ago celluloid was used, but time has proved that it was subject to decomposition when worn in the mouth.

"Gold, platinum and continuous-gum are used occasionally. Aluminum has been used and also alloys of silver, tin, bismuth and some antimony, but these are not satisfactory.

"Obturator and artificial palates are made of vulcanite; the impression being taken with gutta-percha.

"For the correction of congenital cleft palate we use Suersen's obturator; its modification by Schiltsky is also used."

Parreidt gives the technic for each and refers to Dr. Kingsley's method which is used in the United States and England.

UNITED STATES.

In 1766 John Wooffendale came to this country from England, and while practicing in New York constructed an upper and under set of teeth for William Walton. Some believe that this was the first full set made in this country. In 1783 he wrote about joining artificial teeth to natural roots.

James Gardette came to America from France in 1778 and practiced in New York and Philadelphia. Probably he was the first of those times to substitute flat clasps for ligatures or wires for holding artificial dentures. He invented the "mortise plate" to which the teeth are secured by means of gold pins

and which permits the tooth to rest upon the gums instead of the gold plate. Some claim that he was the first to use gold plate as a base in the United States about 1784.

Some claim that John Greenwood was the first in the United States to swage gold plates without a knowledge of it having been done abroad. While in New York he carved from the tusk of a hippopotamus a full set of teeth for Washington. The lower set was made of one solid piece—teeth and base carved together—in the upper denture the teeth were fastened on with gold rivets, and both sets kept in place with spiral springs. In 1798 he repaired two sets of teeth he made for Washington, and he mentions screwing the teeth to the bars instead of having the bars cast red hot on them.

A Swiss artist also made a set of teeth for Washington. One authority says of these: "The plate or framework which held the teeth in the mouth was made of iron, and after Washington's death the teeth were sent to the New York loan exhibition in aid of Washington's memorial arch, but the committee deemed them too horrible to display."

Edward Hudson, from Ireland, settled in Philadelphia in 1805 and made many inventions and devices.

John Randall was born in 1773 and settled in Boston, where his success in crowning teeth was very great.

Leonard Koecker, in 1832 published "An Essay on Artificial Teeth" and in 1842 "Principles of Dental Surgery," in which he says: "In Germany, Russia, Holland, Portugal, Spain and Italy, dental surgery is far less advanced than in other countries. When I was in Germany in 1823 I made the painful observation that all my friends and relatives who had sought the assistance of the dentist for any other purpose than that of the extraction of a tooth, had been most grievously injured, and that none of them had derived any benefit from it whatever.

"I am informed that now in Rome there is not one dentist of prominence in his profession.

"In 1811 after I came to the United States I saw a pivot tooth which had been set by Dr. Kuhn, of Lancaster, Pennsylvania."

Jabez Parkhurst settled in New York in 1807 where he had a great reputation, and carried on a general practice, said to have been the largest in the city.

These and many others were (captains in dentistry) pioneers, and men of industry and mechanical ingenuity. They worked under great disadvantages, but conquered in the end, and we should revere their memories.

Several rare cases of American mediæval prosthesis, one of which is in the

possession of Professor T. W. Brophy, are described by Professor B. J. Cigrand. Of one he says: "The piece consists of ivory, carved to fit the upper and lower jaws. The block was carved so as to fit the alveolar ridge, and on each side a bicuspid and two molars were carved in the same block. The anterior teeth are human teeth fastened with gold to the ivory. The carving was skillfully done; the sulci and cusps of the molars were artificially reproduced, but the ivory was attacked by caries similar to the effect of that disease on natural teeth.

"Another case in the hands of H. D. Justi, shows an upper partial gold plate supplying all the teeth except the two second molars, and is a grand success. The plate fitted the alveolar process, and slightly covered the hard palate, the teeth were carved from the tusk of the walrus, and the gold pins which penetrated the teeth from the cutting edge through the main shaft and body, penetrated the gold plate and were soldered to the latter on the palatal surface; gold clasps fitted the two natural molars, and aided in keeping the denture in place.

"Another case shows a partial upper and lower connected by spiral springs; the upper denture supplied the upper labial teeth, while the two second molars were still in position. The anterior six teeth were carved from bone and attached with gold; the bicuspid and molars were carved in one block which was riveted to the gold plate; around the natural molars were clasped two gold bands. The lower denture supplied the central incisors, one bicuspid on the right, and two molars on the left side of the jaw; the centrals were human teeth imbedded in sockets of gold which received the roots of the substitutes. From the centrals there was a continued bar of platinum, ending in clasps to surround the lateral and bicuspid natural teeth. The artificial molars and bicuspid were made of one block of bone, and lines of demarcation represented the divisional spaces of the teeth. There was a platinum clasp on the natural molar on the right side."

PORCELAIN TEETH.

A "History of Dental and Oral Science in America," published in 1876, says: "Porcelain teeth though used in France so early as 1774 were not introduced into this country until 1817, when Dr. A. A. Plantou arrived in Philadelphia from Paris and engaged in the practice of dentistry. The teeth made in France and brought here by Plantou were of such form, color, and material as would now be regarded with contempt. The front teeth were in shape almost like a split bean, the labial surface being rounded and enameled, the palatal perfectly flat. Lengthwise across this flat back was formed, before baking, a

half-round groove, in each side of which were inserted small pieces of platinum. This groove was for the introduction of a round gold wire against which the platinum points were hammered, and solder flowed on the metals, thus securing the wire to the tooth.

"Charles W. Peale (who painted a portrait of Washington) was the next after Plantou to manufacture mineral teeth in the United States. His first teeth, about 1822, were made with holes through them for riveting to the plates, as he had been accustomed to do with teeth of animal substances, but these proving inefficient he placed platinum wire in the composition before firing it.

"A metal backing could be attached to this tooth by the platinum pins being riveted and soldered to the backing, and then the backing could be soldered to the plate."

S. W. Stockton began his experiments in 1825, and was the first in this country whose manufacture of porcelain teeth attained to any commercial importance, about 1830. His stock was kept in bottles. The modern method of fixing on cards of wax was first suggested by Dr. Corydon Palmer, of Warren, Ohio.

Among those who made teeth for their own use were Drs. McIlhenney (1826); Ambler and Spooner (1828); Flagg (1830); S. Spooner (1831); Harwood and Tucker (1833); Alcock and Allen (1835); and Wildman, who began his experiments in 1837. He made painstaking investigations and achieved notable results. "His work was so important and far-reaching that he has been accorded the honor of having been first to place the manufacture of porcelain teeth on a scientific basis."

In 1844 S. S. White began to manufacture teeth in Philadelphia, and the S. S. White Dental Manufacturing Company has been for years the largest firm of the kind in the world.

In 1834 about 250,000 teeth were manufactured annually in the United States; in 1854 about 2,000,000, and in 10,000 different forms. About 1854 the manufacturers began making teeth in moulds. In 1876 White made 4,000,000. In 1900 about 12,000,000 were made by all factories; in 1903 about 14,000,000 by all factories. In 1907 White made 12,000,000, and all others made 8,000,000.

The present degree of perfection has been attained only by years of labor. In producing teeth of good form, color, and life-like appearance the manufacturers have been very successful. The improvements showing transparency, granular appearance and flesh-like tint to the gums, and unlimited shades and esthetic effect are largely due to Dr. Elias Wildman.

"The modern prosthetist should be a 'facial sculptor,' and consider the

lines of beauty, as he will have ample opportunity to exercise his art in restoring individuality in a way that defies detection, and thus establish himself as an artist and an artisan.

"Nothing brings the dentistry of other nations so vividly before us as their prosthetic work. It tells us much if we only stop to analyze it: every tooth, plate, clasp, post, bar and materials speaks to the dental artists' eye in a way he can comprehend, and are typical of the profession and time."

It remained for the American dentist to demonstrate practically that sunken portions of the face could be restored to their original contour by artificial means without injury to the muscles thus raised, and that such dentures could be worn with comfort.

Dr. C. A. Harris says: "Prosthesis constitutes by far the largest and most difficult part of dentistry, and thus makes it a distinct branch of the art of medicine, and gives to it the power to add to health, comfort and enjoyment of life."

"A Popular Treatise on Teeth," written by Spooner of New York, in 1836, says: "Teeth of human beings, animals, ivory, and mineral teeth are used. Of all animal substances natural teeth are preferred. Mineral teeth closely resemble nature in semi-transparency, color, tints, shape, etc., and it is hoped that these teeth will soon banish the use of all others. They can be mounted on gold plates singly with solder, rivet or screw; they are also made in blocks with artificial gums. French teeth are brought here, but the teeth produced here are greater in perfection than those made in any other country. J. R. Spooner, of Montreal, and myself and partner in New York make them and they are superior to all others."

"A Treatise on Human Teeth," written by Kelley, of Boston, in 1843, says: "Ivory, bone, animal and human teeth are used very little now, as mineral teeth have superseded them; dentists manufacture them for themselves, but there are some on the market. One factory here employs thirty workmen. I make mineral teeth and publish what they are made of, and I make small, narrow, yellowish teeth in imitation of nature. In cases when all the teeth can no longer be kept in on separate roots, they are set in on a plate, and this is fastened by two or more pins to the remaining sound roots; these cannot be taken out by the wearer. I use clasps and suction plates, and spiral springs."

"A Treatise on Dentistry," written by George Hawes, of New York, in 1846, says: "I use gold plates with clasps, and pivots."

"Atmospheric pressure or suction plates are good for full cases and good shaped arches; this is the most simple and ancient method of any known, but springs are sometimes used."

Chapin A. Harris, in 1839, said: "The kinds of teeth used are, human, neat cattle, ivory and porcelain.

"During the last four years I have used almost exclusively mineral teeth manufactured by Stockton of Philadelphia.

"Teeth are inserted with pivots, plates, clasps, spiral springs, ligatures and atmospheric pressure."

Harris gives many illustrations showing different kinds of artificial work, and the technic for pivoting, and plates of all kinds.

CONTINUOUS GUM PLATES.

Continuous-gum work consists of uniting single porcelain teeth to each other and to a platinum base by means of porcelain. This was practically carried out by Dr. John Allen, of Cincinnati, Ohio, who devised original and important modifications in the preparation and combination of materials and the modes of manufacturing them, and after a series of experiments, commencing in 1844 and extending over a period of seven years, succeeded in obtaining mineral compounds which vitrified at a heat much below that employed by Delabarre, and the contraction of which corresponded so nearly with that of the platinum base to which it was applied that the shrinkage incident to baking conflicted in no material degree with the practical utility in the mouth; so he introduced this most beautiful style of denture, which surpasses all other substitutes for natural teeth. If some minor details have been added by others, to Dr. Allen belongs priority of practical construction and perfecting of material for body and gum. The advent of this work marked an advance in the esthetics of prosthetic dentistry.

Up to this time little or no thought had been given to restoring with a denture other losses than those of the teeth alone, but Dr. Allen restored to the face and features all losses resulting from extraction of natural teeth and resorption of alveolar processes and gum tissues and the consequent distortion and apparent aging of the features.

"The American Journal of Dental Science," in 1845, gave Dr. Allen the credit of being the first to make contour-work, and in the same year the American Society of Dental Surgeons awarded him a medal for the same reason. This work was fully introduced in 1850 through a patent granted to Dr. Allen, but its adoption was slow from that time to 1860, when vulcanite came into use and continuous-gum lost in favor among the majority of dentists. The priority of Dr. Allen's patent was contested by Dr. W. H. Hunter in a law suit, the progress and result of which were published in the dental journals. (See "Den-

tal News Letter," Sept. 1852, and Jan. 1853.) The only patent, for this work, in the United States was issued to Dr. John Allen, who, in 1851, surrendered it, owing to certain defects, and, in 1856, a new one was issued to him for the process as then improved. Dr. Hunter's earliest and contemporaneous experiments contemplated simply a union of all the teeth by means of a fusible cement, forming a single, continuous block, which was afterwards united to the base by riveting or soldering.

Dr. C. H. Land devised a method of attachment which was in the construction of the teeth which are provided with three pins arranged transversely in the cervical part of the tooth, one in the center, and one upon either side on the posterior lateral aspect of the cervix, the latter being somewhat longer than the center pin. The pins are to be crossed and pressed down upon the plate and the whole united to each other and to the base with solder, after which the continuous-gum body is applied.

The old dental journals contain the formulæ of Steemer, Allen, Hunter, Wildman and Ambler Tees.

Morris Levett's patent enamel was sold in this country in 1852.

The following named furnaces were used for baking continuous-gum: The Philadelphia, in which anthracite coal or coke was used as fuel; the S. S. White used coke; the Verrier used gas aided by the blast from a foot bellows; the Land used gas and gasoline. These old forms of ovens were uncertain and consumed a large amount of fuel and time. They have been superseded by the electric furnace, invented by Dr. L. E. Custer and patented in 1894. It solves the difficulties that have attended porcelain work from the beginning. The invention of the electric oven marks the beginning of modern porcelain work in dentistry; up to this time there was not an absolutely certain method of fusing porcelain, but this oven made it such a simple process that there was a revival of interest in this work. The heat being derived from an electrically heated platinum wire, its purity is insured. It is without gas, noise, odor or dirt. A committee of the American Dental Association reported as follows concerning the origin of the electric furnace:

"After a careful investigation of all evidence, we find that the first practical and public demonstration of the electric oven for fusing porcelain for crowns, and continuous-gum dentures occurred in the office of Dr. L. P. Haskell in October, 1894, when Dr. L. E. Custer used an electric oven of his invention and construction, and then and there fused a practical case for Dr. Haskell. We also find that Dr. Custer did fuse porcelain by electricity early in 1889, thereby antedating any previous record on this subject."

Dr. Haskell says: "Dr. Allen issued many licenses ranging from fifty to

three hundred dollars, but after the court decided in favor of his priority as the inventor of continuous-gum, he generously gave it to the profession." In 1851 Dr. Allen's agent visited Boston and issued twelve licenses, Dr. Haskell and his partner paying one hundred and fifty dollars for theirs. "The teeth used then were plate teeth backed and soldered as for gold work, and then the body and enamel was applied as at present, only the lingual surface was not covered."

Dr. John H. Meyer made continuous-gum dentures in which the entire surface of the plate was perforated with small holes, thus reducing the weight of the metal about one-half, and making the most perfect attachment of the body, the perforations assisting as small air-chambers (about 1892). An up-to-date continuous-gum technic, accompanied with illustrations, by Dr. G. H. Wilson can be found in the "Dentist's Magazine" for January, 1907.

Continuous-gum upper or lower dentures can be made with vulcanite adaptation, the technic of which appears in the "American System of Dentistry," written by Dr. W. F. Litch.

PORCELAIN DENTURES.

In the "News Letter," for October, 1854, Dr. Mahlon Loomis says: "The making of sets of upper or lower teeth entirely of porcelain has been often thought of but now I have demonstrated its practical utility, and patented it in the United States, England and France." He also gives his technic.

In 1853 Dr. William E. Dunn, of Cleveland, Ohio, began to study dentistry and soon after to experiment in all porcelain work, and in 1867 took out a patent which in part says: "The distinction between my invention and that of Loomis is this: I take biscuited teeth and insert them into the yet plastic plate in the matrix, the denture being then removed, biscuited, enamelled and finished in the furnace. Loomis places in the matrix a sufficient amount of porcelain material to form a denture, and then, by hand, gives the required conformation to the teeth, all the material being yet in a workable condition; after which the denture is removed, biscuited, enameled and finished. We both use porcelain alone, but I shape my teeth separately, and insert them into the plastic plate, while Loomis carves his out of the mass which forms the incipient denture." One of the questions for debate before the Northern Ohio Dental Association at Cleveland in 1857, was: "Is the porcelain mode of inserting artificial teeth, superior to other modes?" Dr. Dunn was asked if he used a pyrometer when fusing the materials. He replied that he did not. Entire dentures can be mounted on swaged plates of gold, silver or alumi-

num by drilling holes through the plate; soldering on lugs; punching loops with a special instrument; or stippling the plate with a slender engraver; then attach the teeth with vulcanite. Dr. P. G. C. Hunt, in 1859, was the first one to solder loops to plates and attach teeth with vulcanite.

Years afterward S. D. Engle obtained a patent on the same process.

Dr. A. S. Richmond devised a method of securing attachment of the vegetable plastics to the base plate as follows: "Punch holes in the plate with a special punch; they are especially useful in lower plates, where the holes are punched in a row on the outside and inside one-eighth of an inch from the margin."

The Dr. J. W. Hollingsworth method was as follows: "Perforate the ridge of the plate at intervals, then pass through these perforations, from the inner surface of the plate, headed pins made of aluminum, which after replacing the plate with the pins back upon the die we shrink down to permanency with a hollow punch; the riveting process forms seriate pins which may be bent or flattened to suit the case."

The cheoplastic metal for upper or lower dentures was used in 1855 and patented by Dr. A. A. Blandy in 1856, together with certain processes used in the construction of plates. He says: "In no case now, under any circumstances, has the skillful application of cheoplasty been attended with any other than complete success. This metal resists oxydation under ordinary circumstances, and is free from galvanic influences and metallic taste. Where there is loss of tissues, restoration can easily be made. The price of an office right is one hundred dollars, and my process is secured by four patents. All licenses must be signed by A. A. Blandy and J. Wheelwright, and the holder of a license must have it recorded in the Patent Office within three months after purchase." Then follows testimonials from distinguished dentists such as Thomas E. Bond, Philip H. Austen, William H. Dwinelle, Edward Maynard and Chapin A. Harris. A committee of the Western Dental Society, at St. Louis in 1857, reported favorably on "Cheoplasty," which would have come into general use but for the advent of vulcanite. Dr. Blandy's departure from the United States in 1862 and the failure of the supply of his metal led to its disuse, but much later on Wood, Watt, Weston and White produced a tin alloy which was essentially the same as Blandy's, which was silver, bismuth and antimony. Watt and Weston made special flasks for this kind of work.

Dr. G. F. Reese devised an alloy of gold, silver and tin, which is manipulated by a special method for dentures in a special flask.

Dr. N. W. Kingsley used a cast metal of tin, sixteen parts, bismuth, one part. Professor Charles J. Essig used for upper and partial dentures, tin,

twenty parts, gold, one part, silver, two parts, melted into an ingot for cast work.

Dr. Hayford designed a dental mold for use in manipulating his own and other cast metals. All of the foregoing methods contemplate casting the base plate and attaching the teeth at the same time.

In many cases a plate of sufficient thickness may be cast, and the teeth subsequently attached with vulcanite or celluloid, or the base-plate may be cast in the form of the rubber base and faced with celluloid. Others who experimented with cast tin bases were, Dr. Edward Hudson (1820), Dr. William A. Royce (1836), Dr. George E. Hawes (1850). W. G. Oliver and Thomas Harrison (1856), who patented a tooth without pins to be used for cast bases.

About 1870 Dr. J. B. Bean made numerous experiments in casting aluminum plates, but his process was difficult and rather uncertain in results.

Dr. C. C. Carroll used a prepared form of aluminum which he describes as first being made pure to prevent disintegration, and then alloyed with a small per cent of noble metals that expand in cooling and thus compensate for the contraction of the aluminum, "thus enabling us to cast directly upon the teeth without a fracture, making the base plate and attaching the teeth at the same time. The difficulty of casting aluminum is overcome by the use of our pneumatic crucible, which enables us to force the molten metal into every part of the matrix."

Another method was to cast a base plate and attach the teeth, either plain or gum, with pink rubber or celluloid. The Zeller cast aluminum apparatus resembles the Carroll, but varies in some important features. The first method tried was to blow the metal into the mold; the second was to introduce the metal by suction. Dr. R. C. Brophy says: "In my alloy of aluminum I use five per cent of silver, and after the case is dried out and heated red-hot I place the ingot of metal in the crucible which is attached to the flask, similar to Carroll's, and when the metal fuses I jar the flask on the bench, and this injects the metal into the matrix." He has a special flask and crucible, and uses his gasoline furnace for heat.

About 1891 Ward introduced a process of depositing, by the action of a battery, gold and silver directly upon the surface of the cast obtained from the impression, thus securing perfect adaptation. The surface of the plaster cast is prepared for the deposit of gold by coating it with plumbago. A definite thickness of gold is first deposited and upon this a deposit of silver is made, which is then covered with another deposit of gold. Sometimes a thin silver plate is swaged, and the gold deposited upon it to any desired thickness. In a set of full metal the teeth are attached by depositing gold about and around

the pins, and the backings are portions of the deposited metals and continuous with the plate. This process is also applicable for partial sets, and for combination with vulcanite or celluloid. It can be used for capping crowns, or making cusps, or for removable bridge-work.

In August, 1851, A. Hill, D. D. S., read a paper before the American Society of Dental Surgeons, in which he said:

"Some nine years ago I conceived the possibility of depositing metallic plates upon plaster, but did little about it until two years ago.

"I prepared my cast in the usual way with plaster, then used a small copper wire, to serve as a connection with the battery, which ran diagonally through the cast. The next thing was to render the plaster cast a non-absorbent. For this purpose I found that a solution of gun-cotton in ether would answer. After this is spread over the cast with a brush and allowed to dry, I draw a line with a lead pencil around such parts of the cast as I wish to have covered with the plate; now take a camel's hair pencil and lay over a thin coat of sizing, and upon the sizing lay the gold or silver foil, then let it dry, and it is ready for the battery. In place of foil I sometimes use bronze or copper on the model as a basis. After the plate has acquired sufficient thickness, it is removed from the model, cleaned, and then immersed so as to receive a deposit on both sides. I cannot doubt that the time will come, and that too before long, when in our large cities the dentist will have nothing to do towards preparing a plate, but to make his cast and draw around it the line for the borders of the plate, and leave it with the electro-plater."

Time has shown that this process cannot be carried out with facility and economy sufficient to supersede swaging metal plates.

Collodion as a base for artificial teeth was patented in England by John Mackintosh in 1859, and an improvement was made by Dr. J. A. McClelland of Louisville, Ky., in 1860, and he named the material "rose pearl." It was used by many dentists in the west and south, but after a few years it was discontinued owing to its defects.

The first practical knowledge we had of celluloid was in 1869 when I. Smith Hyatt took out a patent and organized the Newark Celluloid Manufacturing Company. It is composed of pyroxylin, camphor, oxid of zinc, and vermilion and is a mechanical mixture. It is hard, tough, and elastic, a fair non-conductor of heat and electricity, and becomes plastic at 250 to 300° so that it can be molded. That for dental use is about the color of the palate, and it is molded on a plaster cast, or on hollow shells of metal. The flask, containing the teeth, is put into a tank of oil or glycerine; heat is ap-

plied until the blank form of celluloid is plastic, then the flask is gradually closed.

Dr. J. H. Alexander in 1875 claims to have been first to use steam to soften celluloid, and Dr. R. F. Hunt makes the same kind of claim as to the use of dry heat, and also to putting an apparatus on the market to work the material in dentistry.

Celluloid came rapidly into favor and bid fair to dethrone vulcanite, but after being worn in the mouth a very few years it loses its beautiful color. It is not as tough and elastic as vulcanite, wears away, loses its smooth surface, etc., so it has been abandoned.

The new mode continuous-gum was a vulcanite base faced with celluloid; using plain teeth it is the nearest approach to porcelain that has been obtained with plastics.

This same style of work can be made with gold or cast alloy plates, but these styles of dentures never came into general use.

Zylonite is similar to celluloid but much better, for dental use, in color and translucency, and does not scale. It is composed of pyroxylin and camphor and it is claimed to be a chemical combination; it is prepared in blanks and molded the same as celluloid and was used considerably, but when the "rubber patents" expired, both celluloid and zylonite were abandoned.

Dr. Truman (of London, we believe) introduced gutta-percha into the United States as a base for artificial teeth in 1851, and many experiments were made with it in combination with sulphur. Combined with half its weight of sulphur, and the compound then mixed with half its weight of vermilion there was formed a substance called coralite which hardened under the same conditions as vulcanite, but it became so brittle that its use was abandoned.

Dr. Furlong, of Cleveland, Ohio, recently applied for a patent on his "Plastic Impression Rubber," of which he says: "It is strong, durable and flexible, will not scale or irritate the mouth. It takes as accurate an impression as wax or modeling compound, and is used for re-fitting plates that have loosened owing to the resorption of the gums or process, or for perfectly fitting plates that from any cause are a misfit. It is preferred for attaching teeth to new aluminum plates owing to its wonderful clinging properties."

VULCANITE.

Charles Goodyear discovered the remarkable effects of sulphur in combination with caoutchouc, and since 1840 or '43 this has extended its use. In 1844 a patent was granted to him for making soft or flexible rubber. Subse-

quent experiments led to the discovery of hard rubber and in 1851 Nelson Goodyear invented a process for making vulcanite, and in 1855 the first patent was obtained by Charles Goodyear, Jr., for making a dental plate of this material. Then the Goodyear Company bore down upon the dentists like the "vulture on the lamb," and grabbed their hard-earned shekels and carried them away to their vaults.

About 1853 Mr. Bevan, Dr. Putnam, and Dr. Mallett experimented with rubber. Dr. Putnam's vulcanizer weighed 1,200 pounds, and that, with lack of knowledge of the material, caused slow progress; still, in 1858, about 300, and, in 1863, about 3,000 dentists employed it in their practice, and after the patents expired it was, and now is, universally used as it has so many good qualities for a base plate. It is made in a variety of colors, but the white, gray and pink have so large a proportion of foreign matter that they are easily abraded. The cast was coated with soluble glass originally for the purpose of hardening the surface to prevent injury from subsequent manipulations. Continuous-gum, single, plain or gum, block or plate teeth may be used with vulcanite. Ten thousand varieties of teeth in color, form, and size are now produced to meet the demands of the esthetic dentist, and the dento-ceramic art has reached a high state of development.

We now have about twenty different kinds of vulcanizers.

In 1868 Dr. Stuck patented the process of vulcanizing rubber between two polished tinfoil plates, the articulating plate being formed upon a block-tin cast made from the impression. Plates made in this way are more elastic than when made on plaster.

Dr. R. M. Chase invented "a metallic roof plate" which comprises a plate of metal to cover the roof of the mouth and a vulcanized extension attached to the edges of the plate and extending over the alveolar ridge.

Vulcanite dentures can be covered with a gold lining on the palatal surface to prevent the contact of the rubber with the mucous membrane. Dr. John A. Daly devised a lining for the above purpose. About fifteen years ago a writer said he "believed that vulcanite would be totally abandoned as a base for artificial teeth by intelligent and conscientious practitioners everywhere, in the not distant future." The fact is that vulcanite has been and is now universally used where civilized dentistry is practiced, and will continue to be until there is some other equally good and inexpensive material and method discovered. It is unnecessary for the writer to say aught about methods, instruments and appliances for its manipulation, because the dental text-books and journals of all civilized countries are teeming with instructions, etc. There have been numerous patents on ingenious and scientific

appliances, instruments, etc., for manipulating vulcanite, both in this country and abroad, especially on vulcanizers and articulators.

Letters patent were granted to John A. Cummings on June 7, 1864, for an "improvement in artificial gums and palates," and on account of a defect were re-issued January 10, 1865, to the Dental Vulcanite Company, and later on account of a defect were re-issued March 21, 1865, to said company. The Goodyear Company by assignment became the legal owners and issued to dentists, for various sums, "licenses and agreements" to use its process only in their own business, the license not to be assigned, sold, transferred or otherwise disposed of, and the licensee not to encourage infringements, and if he found anyone infringing he was to report it to the company and they were to bring suit against the infringer. These licenses were generally given for one year, and were signed by the licensee, the agent, and Josiah Bacon, treasurer, who, on account of his arbitrary methods and meanness in dealing with the dental profession, was shot and killed in San Francisco. The contest as to the validity of the patent between the Goodyear Company and the whole dental profession of the United States was long and bitter. Finally S. S. White took up the cause for the profession and spent much time and money, and in the end won the case and wiped out the abomination.

CENTRAL CAVITY OR AIR CHAMBER PLATES.

The "Dental News Letter" for October, 1848, contains the following report to the Pennsylvania Association of Dental Surgeons: "The committee appointed by you to examine into the merits of 'Gilbert's patent cavity plate, beg leave to report, that with reference to the priority of invention of this plate, your committee do not pretend definitely to report, in-as-much as numbers claim the originality from ten to fifteen years back; still there does not seem to be any evidence of it, except their own assertions. However, some have constructed a plate with a number of chambers, and consider it to have been done for the same purpose as the single chamber claimed by Gilbert, and that the invention of one is equivalent to the invention of the other, and that substituting one chamber for any number does not entitle the modification to the credit of originality. Now in-as-much as Mr. Gilbert was the first (as far as your committee are aware), to make the 'cavity plate' public, he is entitled to the credit of the invention so far as it subserves the public good, for we make no doubt that those who have been capable of confining it to the secrets of their own closets for fifteen years would do so that much longer. In a great number of cases it has been markedly successful, and in cases, too, where springs

had been unsuccessful. This central cavity seems to be a reservoir, as well for atmospheric air as the elasticity of the gum. By examination of a number of cases which have been worn from four to seven months, no irritation of the hard palate was observable, or unpleasant consequences in any respect. Resolved, That a certificate of approval of the central cavity plate, should be awarded Mr. Gilbert by this society. Signed:

"J. D. WHITE, M. D.

"S. T. BEALE, M. D.

"ELY PARRY, M. D."

At the next meeting of the society a communication from Mr. W. H. Gilbert, a confectioner of Hartford, Conn., was read, thanking the society for the favorable report on his central cavity plate which he invented in 1840. The "Dental Reporter" says: "Dr. Taylor, from a committee, to whom the subject was referred, reported in favor of paying \$404.20 legal expenses incurred by Dr. Potter of Norwalk, or Norwich, while defending a suit against him by Gilbert of New Haven, Conn., for alleged infringement of his patent. Sometime since Gilbert patented a central cavity plate, and then he endeavored to procure from dentists something for its use, and Dr. Potter resisted the claim, having used the 'plate' several years ago. As the case was that of the whole profession, the convention determined to take it up as their own."

In the "Dental News Letter" for July, 1851, Dr. J. D. White says: "Gilbert's cavity plate is perhaps preferable to any with a cavity chamber or chambers that are worth using." Then follows an article on its advantages.

The "American Journal of Dental Science" says that the "elder Gardette of Philadelphia, accidentally fell upon this plan of inserting complete sets of teeth in 1800."

In a "Treatise on Dentistry" by B. T. Longbotham, of Baltimore, published in 1802, he mentions having seen sets of teeth retained in the mouth by atmospheric pressure.

Dr. C. A. Harris says that the "idea of constructing a plate with a cavity suggested itself to him in 1835, but the chamber as then devised was found objectionable and so abandoned."

Dr. W. H. Dwinelle made a "cavity plate" with an external opening and valve for exhausting the air in 1845, and in 1847 Dr. Jahial Parmly made a denture with a simple cavity struck into it by swaging.

Dr. Levatt's "lateral cavities" are placed directly upon the alveolar ridge, as were Dr. Flagg's, which were about one inch in length, by three-eighths in width and one-tenth in depth.

In the "American Journal and Library of Dental Science," Dr. Solyman Brown says: "Few suction dentures are fixed firmly upon the gum, and used successfully for mastication, by mere suction or atmospheric pressure without any aid from the tongue, lips, cheeks, and antagonizing jaws."

In "A Guide to Sound Teeth," by S. Spooner, published in 1838, he says: "Suction cases are exciting considerable interest from the novelty of them, and the advertisements of some dentists, who would have the public believe themselves the inventors of the important discovery."

The "Dental News Letter" for July, 1852, has an article on "air-chambers," by Professor T. L. Buckingham, in which he recommends them.

In 1850 Dr. J. A. Cleveland patented a vacuum chamber, very much like Gilbert's, and generally used for metal dentures, but it had an acute edge which generally kept the tissues sore.

In 1893 Richardson said: "There is no reason for their employment, except in rare cases. Experience has proved that equally secure and much more enduring attachment of the denture may be obtained in the utilization of adhesive force alone." Dr. John Spyer devised for plastic work a thin metallic form, the surface of which is covered with minute papilliform prominences which by displacement of mucus at the points of gum contact effect surface cohesion.

In 1905 Rauhe patented a plate retainer which he claims does away with all objections to the old style rubber suction plates. This retainer is a soft rubber disk vulcanized into the center of the palatal portion of a denture.

In 1904 The Dental Suction Company patented the "Perfection Flexible Suction," which is made of velum rubber and is placed upon the palatal side of the plate before the case is vulcanized.

The vacuum chamber undoubtedly has a field of usefulness, and in full lower dentures it will occasionally be useful.

DENTAL ARTICULATOR.

The dental articulator was invented by J. B. Gariot about 1805, and many forms constructed on principles similar to his have been used since that time.

On August 28, 1848, Daniel T. Evens, of Philadelphia, obtained a patent for an articulator having slot and pin joints, by means of which, as he expresses it in his specifications, "the lower plate is allowed a motion at the joints similar to that which is admitted by the condyloid processes in the liv-

ing subject." This was the first attempt of the kind, but Dr. Evens failed to entirely cover the ground.

The second one in which an attempt was made to imitate the temporo-mandibular joint with the joint mechanism of the articulator, and thus permit a reproduction of the masticatory movement of the mandible, was made by Dr. W. G. A. Bonwill, in 1858.

In 1889 Dr. R. S. Hayes patented an articulator which had one new feature—the direction of the condyle path.

In 1894 G. K. Bagby obtained a patent showing an articulator of the ordinary construction, having attached to its joint pin a removable arm by which a measurement could be taken from a condyle of the mandible to the mesial line of the trial plate, and this measurement be transferred to the articulator. (Dr. Snow in the "Dentist's Magazine").

Many efforts have been made to reproduce the movements of the lower jaw by means of an instrument, and the articulator of Dr. W. E. Walker is nearly correct.

Parfit, Campion and Constant have proved that the path of the condyle is not a straight line, but for all practical purposes it has been so represented thus far, and the idea is further carried out in the Gritman and Christensen (1901) articulators; the former was introduced in 1889 in combination with Dr. G. B. Snow's face bow, which is the first and only implement for the location of the models in the articulator which has, so far, been introduced that fulfills all the conditions of that section of the problem.

CROWN AND BRIDGE WORK.

Artificial crown and bridge-work as now practiced was formerly called "mechanical," but now it requires so much skill, art and esthetics, that the term "mechanical dentistry" does not apply to it. This kind of work in its highest development requires a versatility of talent, and depends upon mastering the fundamental principles and then using good judgment in applying them.

Dentists will be most thoroughly impressed with the beauty and utility of crown and bridge-work when they study the technics and numerous illustrations to be found in the admirable works of Drs. George Evans and H. J. Goslee.

The development and improvement in crown and bridge-work have been very remarkable during the last few years, and now it is considered an artistic and practical part of prosthesis.

Dr. Goslee says: "I have made an effort to present the subject matter in a practical and concise form, and in a systematic and sequential order; heretofore there has been a lack of co-ordination of thought, and co-operation of effort such as would result in a practical classification of requirements, methods and results, and special care has been given to the various methods which are recognized as possessing merit and practicability.

"The practical introduction of artificial substitutes for the natural crowns of teeth, and the ultimate development of crown and bridge-work, is purely the product of the last half of the nineteenth century, and must be placed to the credit of American dentistry."

Dr. Goslee gives the technic, with illustrations, of the following crowns: Brewster, Brown, Buttner, Davis, Fellowship, Foster, Gates, Bonwill, How, Howland-Perry, Logan, Mack, Owens, Richmond, Sanger, Spaulding, Webb, Weston, and also his own special porcelain method.

His book also contains the technic and illustrations of very many varieties of fixed and removable bridge-work, with a chapter of his methods on porcelain bridge-work, which he considers the ideal type of prosthesis.

In the seventh edition of the work of Dr. George Evans can be found the technic, with illustrations, of other crowns than those previously mentioned, viz.: Baldwin, Bonwill, Chuepin, Evans, Farrar, Fillebrown, Hollingsworth, Kirk, Leech, Litch, Parker, Parr, Patrick, Perry, Ryneer, Stowell, VanWoert and White.

In 1873 Dr. J. B. Beers patented his gold cap-crown, all of metal.

In connection with crowns and bridge-work mention should be made of removable or replaceable teeth-facings, such as the Roach, Wedglock, Dwight, Mason and Steele, which have specially prepared backings which are soldered into the bridge, and then when it is all finished the facings are cemented in place. Thus all liability of injuring by heat is entirely eliminated. The Steele is the most popular of any mentioned.

Among the patented, manufactured, and special attachments for removable bridge-work are the Roach, Griswold, Condit, Morgan, Kelly, Bryant and Fossume.

The Taggart method, recently patented, of casting gold inlays to be used as attachments for bridge-work, and also for casting bridges and partial plates, is desirable in many cases. The technic can be found in the second edition of Dr. Goslee's work.

Ancient bridge-work was fastened to natural teeth with ligatures, or clasps of metal, and was quite crude, but in its evolution it has absorbed from every available source whatever would broaden its science and perfect its art, and the

history of crown and bridge-work of later years is one of progress and improvement. Our research in prosthesis has developed the fact that methods once in vogue and almost entirely forgotten have been revived with improvements that make them practically rediscoveries.

Judged impartially, bridge-work has many advantages when practiced by experts who properly construct and apply it. Without doubt it has been abused. Bridges have been inserted where the support was insufficient, or the construction was wrong in principle or faulty from lack of skill. More than this, bridge-work has been passing through the experimental period, when failures are apt to appear more prominently than successes. Dental literature in this respect offers only a repetition of the historical difficulties that attend all new departures in the arts. (Dr. George Evans in 1900.)

Bridges were made and described by the following men: J. B. Gariot, 1805; C. F. Delabarre, 1820; Dr. S. S. Fitch, 1829; William Imrie, 1834; J. Paterson Clark, 1836; F. Maury, 1834, and in 1855 Dr. W. H. Dwinelle described the progenitor of the modern pin and plate bridge, together with the prototype of another form of bridge in present use.

The following data are taken from a paper on "Phases of Crown and Bridge Work," read by Dr. W. Storer How before the National Dental Association in 1905.

This illustrated paper shows the progressive devices so begun and combined that the expert dentist of today and the future, may readily utilize, partially or completely, these ingenious practical prosthetic products of his predecessors.

In 1869 Dr. B. J. Bing originated the pier, span and stop bridge. While in Paris, in 1871, he applied for a patent on the above in England.

In 1873 and 1879, Dr. M. H. Webb adopted the Bing plan, and also made other special bridges.

In 1880 Dr. W. F. Litch made wing-plate and pier-post, or pin-plate.

In 1881 Dr. H. C. Register made a die-struck saddle with soldered stops and screw-with-nut posts.

In 1882 Dr. H. M. Cryer made the backed and soldered two-stop saddle and pier-post.

In 1884 Dr. J. Leon Williams made a Bing-stop, two-substitute and cap-crown bridge, and a crown consisting of a post, root-cap of gold and a porcelain face, similar to the Richmond crown.

In 1885 Dr. J. L. Williams made a collared-hood, three substitute span, bridge, a cap-crown bridge, and also a Bing-stop, wing-end, coupling-bar Richmond bridge.

In 1885 (?) Dr. H. A. Parr made a remarkable combination Richmond cap-crown and wing gum-rest bridge.

In 1886 Dr. W. F. Litch made a Bing-stop substitute hood with headed pin, and arm span bridge, also a half hood and pier-pin three-substitute span and cap-crown fixed bridge.

In 1886 Dr. J. B. Hodgkin made a Bing-stop substitute-span, pier-post and screw-with-nut bridge.

In 1886 Dr. E. Parmly Brown made a Bing-stop baked body substitute in three styles.

In 1886 Dr. G. W. Melotte made a cap-crown, one-substitute, shoulder-pin wing-substitute.

In 1887 Dr. E. T. Starr made a four-stop porcelain tooth that remedies a radical defect in the two-stop.

In 1887 Dr. J. Rollo Knapp made a Bing-stop and Richmond crown two-substitute bridge, also a Richmond crown fourteen-substitute cap-crown headed pin, second molar pier and cuspid canal-post anchorages.

In 1888 Dr. S. S. Stowell made a Bing-stop gum saddle Richmond crown, two substitute bridge, and in 1891 he made a Bing-stop porcelain two-substitute saddle and socketed span for pier post, and pier-stopping fixation, and in 1900 he made a cuspid pier having a large gold filling socketed for a vertical pin on a shouldered extension of the two-substitute span, and a cap-crown for the molar pier.

In 1889 Dr. W. E. Griswold made cusp-caps with pins for socket anchorage in live piers.

In 1900 Dr. G. L. Curtis made cap-crowns having soldered stops to be cemented in like sockets soldered in the backings of the substitutes.

In 1900 Dr. J. Leon Williams made a three-substitute span united by baked body and gum, and having canal post pier fixation by cement.

In 1896 Dr. C. L. Alexander showed his method of preparing the live piers with retaining sockets for corresponding pins in cast cusps or hoods, to which the substitutes can be soldered.

In all crown and bridge-work thus far noticed, the pier fixation or anchorage has been designed for permanency.

Bridges of the Richmond type, like those of the Bing type, are fixed on their piers more or less securely to prevent displacement in their use.

REPLACEABLE CROWN AND BRIDGE WORK.

In 1883 Dr. J. E. Dexter showed his bridge with caps to fit the piers; there is a slit in one side of each cap, thus producing a spring grip.

In 1886 Dr. R. Walter Starr showed an example of the telescoping fixed cap and cover crown.

Dr. Richmond seems to have originated the roof-shaped root end, which with its roof plate and tube for the post of the roof conforming crown, constitutes the present preferred anchorage for oral span removable bridges.

In 1887 Dr. J. L. Davenport made fixed capped and tubed cuspid.

In 1888 Dr. R. Walter Starr made a successful Richmond saddle denture.

In 1888 Dr. George Evans made cap crown piers having gingival stops to limit the thrust of the telescoping collars.

In 1889 Dr. H. A. Parr made a removable saddle secured by boxed lugs and sockets to the piers.

In 1890 Dr. H. A. Parr made a vulcanite saddle span, over fixed bars between cap-crowned piers.

In 1891 Dr. C. L. Alexander made cap crown piers carrying dovetails for like sockets in the laterally three-substitute bridge, and also boxed backings for facings to be fixed by bending down the pins and filling the boxes with amalgam, also, in 1895, close conforming substitutes having partial clasps hung on posts or screws in the lingual parts of live piers.

In 1897 Dr. E. A. Bryant made a porcelain open face crown, guide and clasp.

In 1899 Dr. C. W. Stainton made "open position bridges," the spans of which are cuspid stringers coupling the cap crowns.

In 1900 Dr. J. Leon Williams made a Richmond bridge, the substitutes of which are constructed with the new slotted teeth.

In 1902 Dr. G. W. Schwartz made metal stringers between collar capped pier posts.

In 1901 Dr. A. W. Wimmer made cap crowned piers, telescoping cover-crowns.

In 1902 Dr. Joseph Head made a stop, clasp, and one and two substitute saddle, of the baked body and porcelain gum class.

In 1903 Dr. C. F. Bliven made a one substitute with stops and clasps for live piers.

OBTURATORS IN THE UNITED STATES.

Dr. N. W. Kingsley says: "An obturator is a stopper, plug or cover, hard, non-elastic, and stationary, fitting to an opening with a well defined border and shutting of the passage. Such instruments are applicable to perforations of the hard or soft palate resulting from accident or disease, but they are rarely applicable to a congenital fissure of the velum. An artificial velum is not a stationary stopper, but an elastic, movable valve under the control of the surrounding adjacent muscles, closing or opening the passages at will, and is applicable to congenital fissures, occasionally where the soft palate has been destroyed, but never to perforations of either the hard or soft palate."

Dr. Kingsley excels in the practice of this difficult and important specialty of the dental art. In his illustrated work, published in 1879, he treats of "Congenital and Acquired Palatal Lesions," "History of Obturators," "Appliances for Acquired Palatal Lesions," "History of Artificial Vela," "Treatment of Congenital Fissures of the Palate," "Method of Making Artificial Palates," "Introduction and Use of Artificial Vela," "Buccal Nasal and Maxillary Prosthesis," accompanied with full technic.

No doubt he has done more than any other man to relieve suffering humanity in this direction.

In 1841 Dr. Warren Rowell constructed a very ingenious and practical obturator.

In 1842 Dr. Stearn, a doctor of medicine who was acquainted with Mr. Goodyear, who was experimenting with a combination of sulphur and rubber, being of an ingenious mind and acquainted with the improvements in rubber, gave his attention to the construction of an artificial velum for himself.

In 1845 Dr. John Harris made an artificial palate combined with an artificial nose, as well as with artificial teeth.

In the "American Journal of Dental Science," Dr. S. P. Hullihen describes an obturator which he constructed for a case where the velum was lost by disease.

In 1858 Dr. T. L. Buckingham made an obturator which covered a portion of the posterior surface of the hard, and the anterior surface of the soft palate.

In 1858 Dr. J. D. White published a description of an obturator combined with nearly an entire set of artificial teeth.

In the "Dental Cosmos" in 1860, is described an obturator, made by Dr. McGrath, to supply loss of the soft palate.

In 1860 Dr. N. W. Kingsley made an artificial velum for a case with double

fissure of the lip and extensive fissure of both hard and soft palate, and at a meeting of the American Dental Convention a gold medal was awarded to him for his success and improvements in such appliances, and subsequently the Odontographic Society of Philadelphia awarded him another gold medal for the same reasons. In 1864 Dr. Kingsley visited London and read a paper on the subject before the Odontological Society of that city.

In 1865 Dr. C. H. Harroun of Toledo, Ohio, began to produce obturators, and he presented a patient before the Northern Ohio Dental Association who was wearing, with great satisfaction, one he had made. He has been doing this kind of work ever since.

The history of obturators dates back more than three hundred years, and that of artificial vela more than seventy. The manufacture of obturators and artificial palates combined has met with most encouraging results, and this combination has been made by many of those already mentioned as making obturators.

Nearly, if not all, appliances in this line, are now made of vulcanite or velum rubber, one or both.

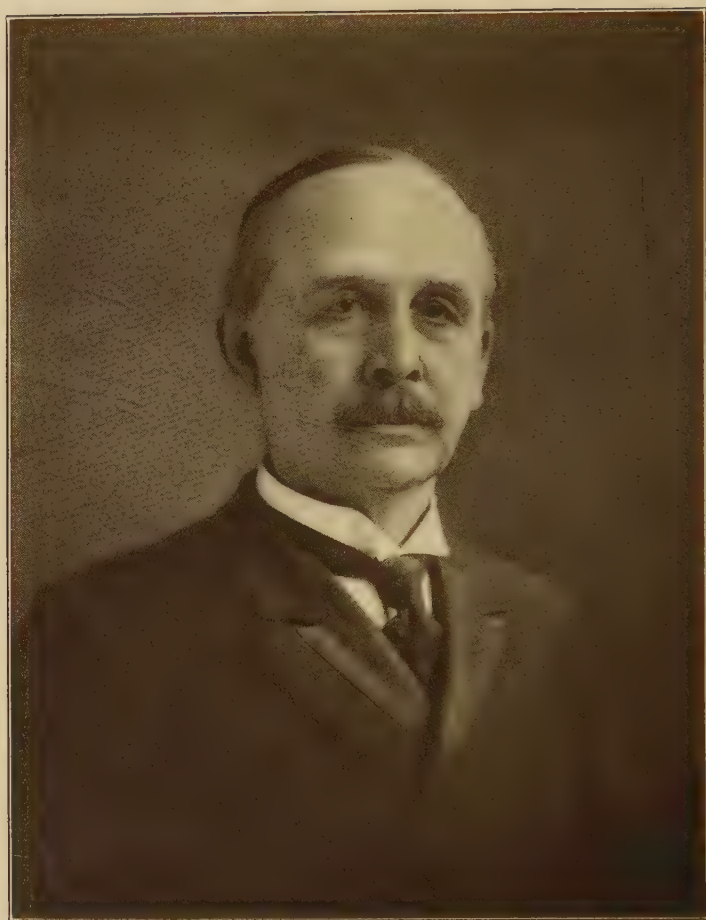
At the meeting of the National Dental Association in 1902 Dr. C. S. Case presented a novel form of artificial palate which he denominated a velum-obturator, which is so fashioned that it can first be made of soft rubber, and subsequently the molds may be utilized for the making of a duplicate in hard rubber. He says: "Through a desire to take advantage of the benefits afforded by a soft rubber appliance on the one hand, and a hard rubber obturator on the other, and at the same time avoid the possibilities of the final inefficiency of the one and the difficulties in construction and adjustment presented by the other, has risen the present artificial palate." Dr. Case has taught and also made practical use of his method in many cases. His technic may be found in the third edition of the "American Text Book of Prosthetic Dentistry."

Beginning with the eighteenth century, prosthesis began to advance, and from that time up to the present it has gained rapidly in usefulness, inventions and art.

To dentists in this country is due much praise for advancements made, but let us not forget that we owe to France and England our first knowledge of professional matters.

One who visits the model-room of the patent office in Washington will at once become convinced that American dentists have been prolific for inventing mechanical devices, labor saving appliances, etc., etc., to aid in the upbuilding of dentistry.

Every age should profit by the experience of the preceding one, but without a *historical record* of what has been accomplished, each investigator commences a new series of trials and wanders over the same ground in search of truths which had long ago been discovered.



S. C. Guilford

History of Orthodontia

By S. H. Guilford, A. M., D. D. S., Ph. D.

Professor of Operative and Prosthetic Dentistry and Orthodontia in the Philadelphia Dental College.

THE beginning of this particular branch or subdivision of dental practice, like those of many of the other arts and sciences, is lost in obscurity. That it is of comparatively recent origin is shown by the fact that but one reference is made to it by the medical writers of the sixteenth and none, so far as we have been able to discover, by those of the seventeenth century. This may be attributed to three causes.

1. Previous to the sixteenth or even the seventeenth century, medicine, from which dentistry naturally sprang, was in a very crude and elementary condition. Occupied with the problems of diseases in general and seeking after remedies for their alleviation and cure, the practitioners of those days naturally had little inclination to address themselves to the correction of deformities which were deemed of minor importance and which entailed no actual suffering upon, or even marked inconvenience to the individual.

2. With the limited knowledge that then prevailed both with regard to the minute anatomy of the parts involved and their true physiological functions, it was quite natural that the surgeons, or the "barber-surgeons," should have hesitated to attempt any extensive changing of the position of the teeth even had they desired to do so.

3. For such surgical operations as were imperatively demanded the instruments of that day were of the crudest character, and while they served their purpose for major operations would have been quite unfitted for such delicate work as would be called for in the oral cavity.

Observing that teeth did often change their positions without apparent cause, it is quite probable that at a very early period surgeons advised resort-

ing to simple methods for assisting a single misplaced tooth to assume its proper position.

Indeed, we know that finger pressure was used when a simple direct movement was needed and that a notched piece of hard wood was often employed to rotate a single incisor. As these methods served their purpose to a degree it was but a step in advance to produce the same results more rapidly by the use of a steel instrument.

Furthermore we are informed by the earlier surgical writers that it was a very common practice to extract a tooth when its malposition caused unsightliness or inconvenience. The earliest record we have of even the simplest treatment for teeth out of position is that contained in a pamphlet published in 1541 by Egenolff,¹ entitled "Medicine for the Teeth, to Keep Them Good and Sound." In it he says:

"It often happens that to children more than seven years of age, when the teeth begin to drop out other teeth grow by the side of those which are about to drop out; therefore we should loosen the tooth about falling out from the gums, and move it to and fro until it can be taken out, and then push the new one every day toward the place where the first one was, until it sits there and fits in among the others, for if you neglect to attend to this, the old tooth will remain, become black, and the young one will be impeded from growing straight, and can no more be pushed to its right place."

For nearly two centuries after this we have no record of efforts to correct irregularity of position of the teeth. That such attempts were made, with possibly some success and some improvements, it is reasonable to suppose, but as it was not customary then for those performing operations upon the teeth to publish or communicate their ideas to others for fear of their adoption, we have no means of knowing just what progress was made.

However, during this long interval dental practice, crude as it was, was gradually passing from the hands of the surgeon and the barber to those of the surgeon-dentist. The importance of the dental organs and the necessity for their proper care were beginning to be recognized by the general surgeon, so that the development of a class of practitioners who should devote themselves to the treatment of the teeth was a natural result. The first of this class who, having been trained in general surgery eventually devoted themselves to dental practice, was *Pierre Fauchard, of Paris*.

PIERRE FAUCHARD's first work, entitled "Le Chirurgien Dentiste," was

¹ Dental Cosmos, Vol. XXIX, p. 1.

published in 1728 in two duodecimo volumes, with forty illustrations. So far as we know it was the first text-book ever written devoted solely to the teeth, their diseases and proper treatment, and so well did it serve its purpose in that day that it continued to be the authoritative work upon the subject for nearly a hundred years. In the chapter devoted to "Correction of Irregularities of the Teeth" he not only mentions the employment by preceding dentists (and possibly by himself) of some of the simpler methods of moving teeth—finger pressure, thread, silk, little bars or strips of gold or silver, and, occasionally, the forceps—but also describes his own methods which he had developed.

In his description of the plan to be followed in certain cases he says:

"If the teeth are much out of line and cannot be corrected by means of threads, it is necessary to use a band of gold or silver. The band must be neither too stiff nor too flexible. Two holes are made beside each other at both extremities. Through these holes threads are passed by which they are ligated to the teeth adjoining the one out of line. If the tooth is inclined outward (labially) the plate is exteriorly applied," he continues; "if it is bent inward (lingually) the plate is applied inside of the teeth (arch). By the pressure and support given by the band the inclined tooth will be made upright in a short time."

Fig. (1)¹ shows the metal strips before being placed upon the teeth, while Fig. (2) shows one in position, designed to move a misplaced lateral incisor labially into line.

Fig. (3) illustrates his method of applying the strip to move outward both of the upper laterals.

Fauchard also mentions the use of the file to remove portions of adjoining teeth which interfered with the movement of the misplaced one into proper position. This use of the file to provide space seems to have been a common practice at that period and later. He seldom resorted to the extraction of teeth for regulating purposes, probably believing

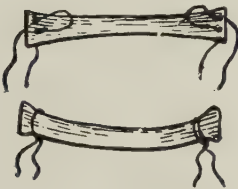


Fig. 1 (F)



Fig. 2 (F)



Fig. 3 (F)

¹ Illustrations marked (F) are copied from Farrar's *Irregularities of the Teeth*. Those marked (W) were kindly furnished by the S. S. White Dental Co.

that it was not advisable, but he often moved teeth into line forcibly by means of the "pelican" (a form of *key*) and the forceps, and then held them in place by ligating to the adjoining teeth.

This immediate movement of the teeth he practiced principally in the case of patients thirty or forty years of age and he states that he believes the method to be original with himself.

BOURDET—(1757 and 1786) carries the use of the metal strips a step farther than Fauchard. Whether one or several teeth were to be moved labially or lingually the metal band was made long enough to extend from a molar on one side to the corresponding molar on the other side, with two

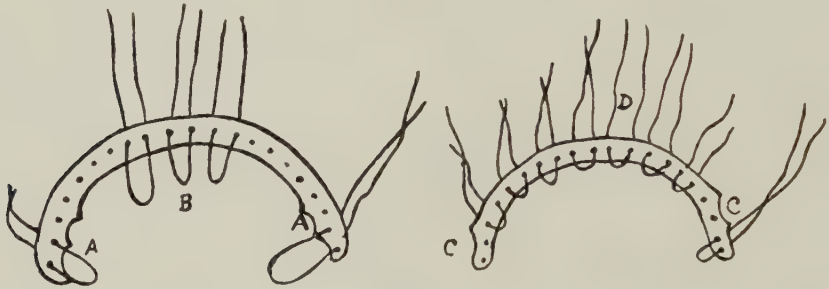


Fig. 4

holes in the band opposite each tooth included in the series. These holes were for the passage of ligatures by which any or several instanding teeth might be tied and drawn outward until they touched the band. The last two holes one each side were for ligating to the molars which served as anchorages for the band. Two of these bands, one for the upper arch and the other for the lower, with ligatures in position are shown in Fig. (4). As the band was bent or curved to approximate the outline of a normal arch, the tension of the ligatures on the instanding teeth and the pressure of the metal strip upon the outstanding ones would serve to bring all into alignment. He says: "the strips of plate ought to be of gold, never of silver," and that the ligatures should be removed twice each week. We have here the original inception of the *alignment-arch*, which after many modifications and improvements is today recognized as one of the most valuable auxiliaries in orthodontic operations.

BERDMORE—in the second edition (1770) of his work upon the teeth, devotes two chapters to regulation. He follows the methods of Fauchard and Bourdet in using strips of metal ligated to the teeth, and at times the forceps. For ligating purposes he used “gold wire, or silken ligatures,” and for an instanding incisor he would attach a ligature to a molar, pass it over the buccal surfaces of the intervening teeth, under the incisor and again over the remaining teeth, attaching it finally to a molar on the opposite side. He also filed teeth to make room for moving a malposed tooth into position.

HUNTER—in the second edition of his “Natural History of the Human Teeth” (1778), has a large drawing showing a side view of the natural teeth, in *normal occlusion*. It shows distinctly the relation of the upper and lower teeth, their overlapping, interlocking of cusps, etc. He records his emphatic objection to the removal of deciduous teeth to make room for the permanent ones, and advises the pressing of a misplaced tooth into normal position, which he says, “is easy in young people.”

He thought that regulation should not be undertaken until all of the bicuspid had fully erupted, and for the correction of prognathism advised the extraction of a bicuspid on each side of the arch. In “certain cases” he believed that the rotation of a tooth was possible.

FOX—(1803) used the long metal strip similar to that of Bourdet, but attached to each side a gag-block of ivory or bone to rest between the upper and lower teeth, and thus keep them apart while instanding incisors were being moved outward into line.

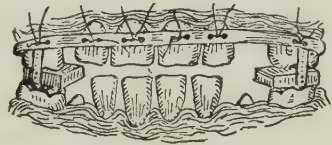


Fig. (5) shows his appliance in position. Fox is also the first writer to speak of occipital resistance or anchorage by the employment of a skull cap for the retruding of protruded teeth.

Fig. 5
Fox (1803) (F)

CATALAN—(1814) introduced the principle of the inclined plane for moving inlocked upper incisors outward into line. As then made it consisted of a narrow band of gold or silver passing around the labial surfaces of the lower teeth from molar to molar and secured to the latter by ligatures. Pieces of heavier metal were soldered to this band and bent inward at points opposite the instanding teeth of the upper arch, so that the latter in occluding would be forced outward. These metal inclines had a metal portion to rest on the



Fig. 6
Delabarre's "crib" (F)



Fig. 7
Crib in Position (F)

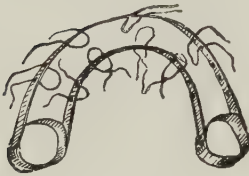


Fig. 8
Desirabode (1823) (F)

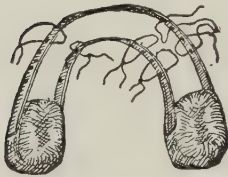


Fig. 9
Bands with Crown Caps
Desirabode (F)

cutting edges of the lower incisors to resist the strain. In later years this appliance was greatly improved from time to time and was considered so valuable that several authors laid claim to its origination. Its use, however, was open to some objections which gradually led to its abandonment.

DELABARRE—of Paris (1819), in his work on "Second Dentition," has much to say upon the subject of regulating. He describes and illustrates for the first time a metal appliance for rotating a tooth. Previously this operation, though seldom resorted to, consisted in turning the tooth by means of a notched hickory stick applied daily, or by a silk ligature passed around the tooth and tied, and then carried to some distant tooth and secured. Delabarre's appliance consisted of a metal box or band fitted closely to the tooth with a short open tube soldered endwise to the labial or lingual surface. This tube was threaded on the inside and engaged the end of a rod of gold wire bent at right angles near the end and also threaded. The farther end of the wire was formed into a loop. The threaded end of the wire being screwed into the tube on the band, the latter was placed upon the tooth and the free end bent down and tied through the loop to some posterior tooth. The spring of the wire caused the tooth to turn in its socket.

Delabarre also devised the first wire crib (*grillage*) to keep side teeth apart while moving front ones, a device which later found greater usefulness as an anchorage for the attachment of accessory devices in regulating. The crib consisted of six pieces of gold wire bent and soldered together as shown in Fig. (6). When completed the sides were bent slightly toward each other so as to hug the teeth closely at their necks when sprung into position. Its application is illustrated in Fig. (7).

DESIRABODE—(1823) introduced the double metal band with ferrules for the anchor teeth, as shown in Fig. (8). The narrow strips he called "*bandlettes*" and the ferrules "*bracelets*." The inner band was evidently

intended to have ligated to it teeth that were to be drawn inward and the outer band those to be drawn outward.

Sometimes instead of the ferrules he used what he designated a "true cap" shown in Fig. (9) which was in reality a gold crown. For ligatures he used "a thread of raw silk, waxed, or of *platina*, and twist it around the tooth to be replaced."

MAURY—of Paris (1828), in describing his method of using ligatures, illustrates devices of bent gold wire to engage with long horizontal ligatures and catch over the cutting edges of the teeth so as to prevent the ligatures from slipping up and irritating the soft tissues.

BELL—of London (1829), and (1831), in his book deprecates the early extraction of deciduous teeth and approves in general of Delabarre's



Fig. 10

Maury Guard Hooks
(F)

writings and methods. He says that extraction should be adopted only as a last resort and if we wait for the results of normal expansion, extraction may not be necessary. He used the alignment arch (bar) and silk ligatures. His bar differs from that of his predecessors in that instead of forming a smooth curve, it is "stamped to accommodate

it to all depressions and elevations of the teeth, except that opposite the irregular tooth it should stand away so as to allow the teeth to be brought into line before coming in contact with the bar." He says the elasticity of the bar when the tooth is ligated to it will serve as a constant force acting upon the tooth to bring it forward. He favors the use of gold caps (crowns) upon the molar teeth to prevent occlusion while the anterior teeth were being moved. He thought that correction should be begun at least by the twelfth or thirteenth year "and as much earlier as possible." His book contains many illustrations, including two excellent full page drawings of the jaws and teeth in normal relation, showing the interlocking of cusps from cuspids to third molars.

SCHANGÉ—of Paris, in the second edition of his book (1842), goes more into detail and records more notable advances in practice than any of his predecessors. He mentions three ways of obtaining space to accommodate irregular teeth.

1. Filing, of which he entirely disapproves.
2. Extraction, which affords more space than is needed.
3. Enlargement of the arch, which he considers much the best plan.

He also describes three kinds of ligatures. Hemp or linen; silk; and gold or platinum "drawn down fine." He preferred hemp or silk because they

absorb moisture and contract, and because of their adaptability. Metal wire he did not favor because it was difficult to adjust, did not contract and the patient had to be seen from day to day to have it tightened. He recommends the use of metal bands or clasps upon the teeth to which ligatures may be conveniently attached.

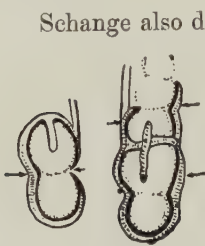


Fig. 11

Schange's Crib (F) of Delabarre's in that it was intended simply as an anchorage for the securing of ligatures, wires or metal strips and was not intended to interfere with occlusion.

The use of the head-gear of Fox for occipital resistance in connection with the inclined plane of Catalan for retruding the lower jaw is also advised by this author.

FOX AND HARRIS—(Philadelphia, 1846), devote much space to the causes of irregularity and necessity for treatment, and while the plans of many predecessors are described and generally commended nothing especially new in the way of procedure is advanced.

TUCKER—of Boston (1846), soon after the introduction of elastic rubber in sheet form, conceived the idea of using the resiliency of this substance for the moving of teeth. Narrow strips were cut, passed around the tooth or teeth to be moved, and their ends secured at some distant point so that constant tension was exerted. It proved of great value, far exceeding in efficiency the ligatures of silk or wire previously used.

Later, when elastic rubber was manufactured in the form of tubing, cross sections were cut from it and applied as before, but with greater convenience and security. Although in recent years this method of applying force has been largely superseded by the elasticity of metals it still serves as a valuable accessory in many cases.

DWINNELLE—of New York, in 1849, invented the steel jack-screw for the moving of teeth. It operated between metal bands attached to the teeth to be moved, and proved so efficient that it was generally adopted and employed

for many years. It seems to be the first time that the principle of the screw was utilized in the regulation of teeth.

GAINÉ—of London, seems to have originated the same idea at about the same time without any knowledge of what had been done by Dwinelle.

THOS. W. EVANS—who returned from Paris to America on a visit in 1853 read a paper upon “The Regulation of Teeth” before the Society of Dental Surgeons in session at West Point, N. Y., on Aug. 3rd.¹ In it he mentions four requisites for success in regulating, namely:—(1) Firm support; (2) Steady and sufficient pressure; (3) Great delicacy of construction; (4) Simple mechanism. To illustrate some of his own methods of operating he describes several cases.

1. *Restoring an oblique upper incisor to its place* (rotation). “Adjusting a gold band (22k) round the center of the tooth to be operated upon, I solder to the front of this band and directly across it a small gold tube, the bore of which is about the size of a common pin; through this tube I pass a hard-drawn wire, fitting very closely, and then attach the outer end of it (which has a loop or eye for the purpose) to the yoke or skeleton cap upon the molar or bicuspid teeth. Fig. (12).



Fig 12 (W)

For retaining the rotated tooth in position Dr. Evans constructed a flattened gold bar to pass from cuspid to cuspid with delicate hooks to engage with the incisal edges of the neighboring incisors. The bar was ligated to the cuspids and the rotated tooth fastened to the bar with a silk ligature. Fig. (13).



Fig. 13
Retainer[Evans] (W)

2. *Protrusion of the front teeth.* In this case Dr. Evans employed a “narrow elastic bow of gold” attached to the teeth to be operated upon by a crib of two gold hooks. The bow was bent to conform to the arch and at its ends is attached, by means of spiral springs, to cribs upon the molars on each side. See Fig. (14). To avoid moving the anchor teeth and to provide firm support he swaged a thin gold plate to cover the vault and soldered it to the molar crib anchorages.

¹ Dental News Letter, Vol. VII, p. 65, *et seq.*

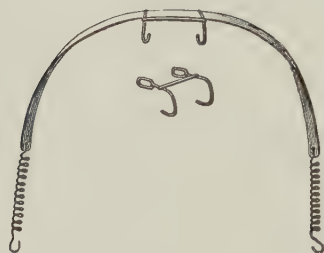


Fig. 14
Retrusion [Evans] (W)

rubber tubing over the teeth and bow wire, all as shown in Fig. (15).

The fourth case described is very similar to the third, except that in this instance some of the teeth are to be moved outward and others inward into line.

Other cases described are: *Bringing forward a lateral incisor; Protrusion of the eye-teeth; Protrusion of one or more of the lower front teeth.*

All of these cases, as Dr. Evans remarks, are simply illustrative of some of the methods he employed in the correction of irregularities. Embodying many principles that were known and used, they nevertheless display considerable originality and adaptation of means to an end. In its practical features it appears to be the most important paper upon the subject presented up to that time.

It will be noticed that thus far the base for the attachment of accessories in the movement of teeth was, in nearly all cases, a metal plate or appliance of some form which required skill to construct in order fully to adapt it to its purposes.

In 1853, however, when the artificial induration of caoutchouc was discovered by Nelson Goodyear and made a commercial success in the manufacture of combs, buttons, etc., that material soon came to be used as a base for artificial teeth. The many valuable properties possessed by the new product, vulcanite, quickly led to its adoption as a base or foundation for regulating purposes.

3. *Moving incisors outward into line.*—To accomplish this, having constructed his crib anchorages, Dr. Evans soldered to one of these a gold wire which passed around in front of the teeth to the crib on the opposite side. To the latter it was secured by passing through a tube soldered to the crib and made adjustable as to length by means of a nut operating upon the threaded end of the wire. When in position he passed rings cut from

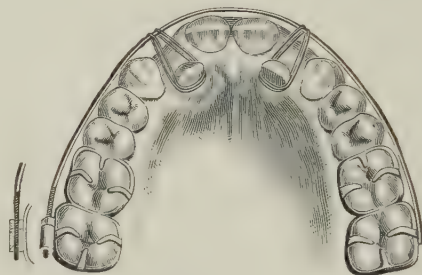


Fig. 15
Labial Movement [Evans] (W)

The first use of it in this connection as far as we are able to discover, was made by Jos. Richardson about 1860. The first published illustration of this method is shown in Fig. (16).¹ The appli-

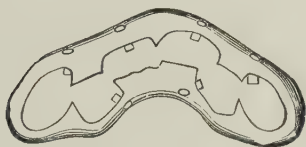


Fig. 16
Richardson Plate

ance consisted of a frame of vulcanite molded to the gums and teeth of the region in which the movement was desired. On the side of the frame where force was to be exerted, holes were drilled and wooden pegs inserted, while on the opposite side the vulcan-

ite was cut away sufficiently to afford space for the moving teeth. The pegs were replaced every day or two by longer ones and by their expansion under moisture and the elasticity of the vulcanite frame the teeth were gradually moved into position. The movement was necessarily slow and the appliance cumbersome and unsightly, but it was simple and easily constructed and with modifications and improvements found favor for a number of years.

The common form of retainer employed by Dr. Richardson consisted of two narrow strips of vulcanite, molded to fit the gum and slightly embracing the teeth at their necks. One of these fitted the labial surface and the other the lingual, while they were joined by two flat pieces of gold passing between the teeth, one on each side of the arch as shown in Fig. (17).

TOMES—in his book on “Dental Surgery,” (1853) says that irregularities of the teeth can be corrected at any age. He speaks of the importance of employing steady pressure and describes a few ways of applying it. He sometimes resorted to extraction to simplify regulating, and for retention advises the weaving of fine gold wire in and around the corrected tooth and adjoining ones. He observes that Fox advocated immediate interference for correction at any age. He further states that Lefoulon contended that none of the permanent teeth should be extracted, but that the dental line (arch) should be expanded instead; also that Robinson held this same view.

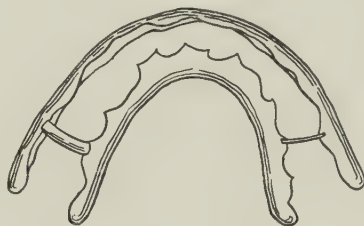


Fig. 17
Richardson Retainer

HARRIS—in the sixth edition of his book (1855), describes and illustrates the use of a gold band with knobs or projections on opposite sides to be fitted to an incisor for the purpose of rotating it, ligatures being fastened to the knobs and then carried, one in one direction and one in another, to distant teeth for anchorage.

¹ Illustration furnished by P. Blakiston's Son & Co.

Both Delabarre and Evans had devised and made use of short tubes soldered to bands for rotating purposes, but Harris seems to have been the first to employ knobs soldered to bands for the same purpose.

WESTCOTT—(1859)¹ devised an appliance of metal for both lateral and anterior expansion of the upper arch. The latter operation was accomplished by the use of four individual jack-screws (one for each incisor) attached to a bar extending across the arch. The pointed ends of the screws rested in shallow pits drilled in the lingual surfaces of the teeth. Dr. Westcott, who had devoted many years to the regulation of teeth and had gained much experience thereby, formulated a number of rules to govern a practitioner in deciding upon the acceptance and carrying forward of a case of regulating. In brief, they were as follows:

1. Does the patient or parents or guardian fully appreciate the nature and importance of the proposed operation?
2. Consider well the health and constitution of the patient.
3. Never curtail any effort for fear that it might cause you financial loss.
4. Take impressions and study the case well.
5. Set the price before you begin and require at least one-half payment in advance.
6. Do not be discouraged by difficulties that may arise, but persevere until you succeed.

Tomes in the edition of his "Dental Surgery," published in 1859, treats extensively of irregularity, its causes and various forms, and describes several kinds of apparatus to be used, but they differ only slightly from those employed by his predecessors and exhibit no advantage in the mechanical principles involved.

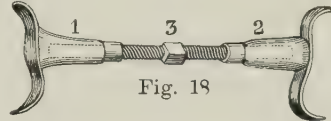
E. H. ANGELL (1860) in a lengthy and interesting paper² contributes several valuable and advanced ideas upon the subject of regulating. He describes in full detail the eruption of the various members of the permanent set. Beginning with the first molars, he says:

"These teeth, four in number, are the first of the permanent set to take their positions in the mouth, and are usually fully developed and admirably articulated before any of the primary teeth have fallen from their sockets. Nature has thus, in her munificent wisdom, provided *a sure and unerring guide to the correct occlusion of the jaws*, despite the loss of the deciduous set. By the presence of these organs, correct articulation is preserved, while without them there is no security against deformity and distortion of the features."

¹ Dental Cosmos, Vol. I, p. 60.

² Dental Cosmos, Vol. I, pp. 540 and 599. Copied from San Francisco Medical Press.

Later he advances, for the first time on record, the *opening of the median suture* to provide space in the arch to accommodate teeth not occupying their normal positions. To illustrate his method of operating in such cases he describes in detail the successive steps taken and appliances used in bringing an outstanding cuspid into line. Noteworthy among these is a jack-screw, with a right hand thread at one end of the shaft and a left hand thread at the other, with a square center, as shown in Fig. 18. Another interesting device is one by which he moves teeth posteriorly in the line of the arch, using a screw, nut and tube to supply power and a swaged metal plate fitting the roof of the mouth for resistance. This is shown in Fig. 19. The tube is soldered horizontally to a band or clasp surrounding the tooth to be moved, while the nut is soldered to the plate some distance away, the screw operating between the two. Its resemblance, in general feature, to some more modern appliances is noticeable.



Double Acting Screw Appliance
[Angell] (W)

N. W. KINGSLEY, who in 1871 began the publication in the *Dental Cosmos* of occasional papers on regulating and palatal deformities, culminated his efforts in these special lines by publishing, in 1880, his work on "Oral Deformities." It was not only the first American work published upon the subject of irregularities and cognate subjects, but the first in the world in which the subject was comprehensively and scientifically treated. Comprising, as it did, not only the results of his own labors and devisings but also a summary of the efforts of those who had preceded him, it attracted attention as had never been done before to the importance of this special branch of dental practice. In addition, it proved a real benefaction to the limited number of those who had begun to be interested in the subject and were seeking further knowledge in regard to it.

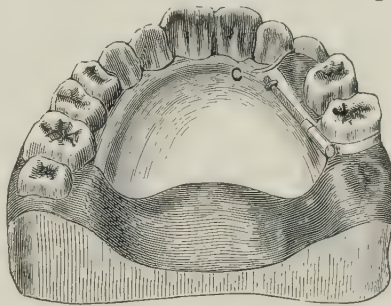


Fig. 19
Metal Plate and Screw for Retraction
[Angell] (W)

Although, as we have seen, vulcanite had previously been used in connection with appliances, Dr. Kingsley greatly widened the field of its usefulness by employing it in a diversity of ways and forms that before had not been

thought of. While it formed the base of the greater of his most valuable appliances, he also made free use of the jack-screw, the wire arch, elastic rubber rings, silk ligatures, etc., combining them in a variety of ingenious ways to produce results that had hitherto not been attained by far more intricate apparatus.

His methods for treating both upper and lower protrusions were, perhaps, the most noteworthy of the many that proceeded from his fertile brain, and he must be accorded the credit of first proposing and then executing the bodily movement of the lower teeth from a posterior position forward into normal occlusion with the upper. This movement he aptly termed "jumping the bite."

In the summer of 1871 the writer, while calling upon W. E. MAGILL, saw him cement a platinum band to a lower cuspid tooth to aid in the operation of rotating it. The band had a narrow bar of gold soldered to its outer face which was designed to be bent down and tied to some distant tooth. An appliance of this character had been used long before, but no mention had ever been made of cementing it to the tooth to secure greater stability. The idea of securing attachment in this way seemed a simple one to the originator, but to the on-looker it proved a revelation. Its great possibilities were apparent at once, for it solved the problem of fixation which had puzzled the profession for many years. Impressed with its great value, the writer at once adopted it in his practice and published it for the benefit of others. Its application was soon extended and virtually led to the devising of simple metallic retaining appliances which have grown in favor ever since. Cementation not only serves to secure them rigidly in position but it protects the enclosed teeth from the deleterious action of acidulous saliva. The importance of Dr. Magill's simple idea may best be realized when we consider that virtually all of the metallic devices for regulation and retention in use today would be almost valueless without the aid of cement attachment.

In 1876¹ J. N. FARRAR began the publication of a series of articles on regulation to which he later gave the title: "Regulation of the Teeth Made Easy By the Positive System." In these papers he sought to show:

(1) That pain in the movement of teeth was due to uninterrupted movement such as is produced by the use of elastic rubber, metal springs, etc.

(2) That changes occurring in the tissues around the teeth during movement are physiological in character if confined within certain limits and pathological if such limits be exceeded.

¹ Dental Cosmos, Vol. XVIII.

(3) That to control pressure it must be positive with alternating periods of movement and rest.

(4) That these conditions can only be met by the use of the screw in some of its many forms, and occasionally by the inclined plane, because in each of these cases the pressure is intermittent.

After a long series of experiments upon the natural teeth Dr. Farrar arrived at a conclusion in regard to permissible movement in regulating which he formulated into the following "law."

In regulating teeth the dividing line between the production of physiological and pathological changes in the tissue of the jaw is found to lie within a movement of the teeth acted upon—allowing a variation which will cover all cases—not exceeding $1/240$ or $1/160$ of an inch every twelve hours.

His views upon these points were never endorsed by other writers nor accepted by the profession. His various articles show that while he did place his greatest reliance upon the principle of the screw, in his practice he also frequently resorted to the use of elastic rubber, springs, ligatures and vulcanite plates. He devised many appliances for producing individual movement of teeth, all of which were constructed of precious metal, principally gold. Later these were made by the S. S. White Company, and offered for sale in the belief that practitioners would gladly avail themselves of them, but they did not meet with favor and were soon withdrawn from the market.

In 1888, Dr. Farrar published the first volume of his monumental work, entitled "Irregularities of the Teeth and their Correction." In 1898 the second volume appeared. These volumes contained not only the results of his earlier work as published in dental periodicals, but a large mass of new matter covering his later experience, as well as a valuable historical outline of the work of his predecessors. With all the wealth of information imparted in regard to the methods of moving teeth to bring them into the arch line, the author seemed not to have realized the necessity of bringing about a new arrangement of one or both dental arches so that normal occlusion would result—a matter of the greatest importance. His various devices and appliances as explained and illustrated evidence an intimate acquaintance with mechanical principles and great ingenuity, but their complicated character evidently prevented their general adoption.

At the seventh International Medical Congress, held in London in 1881, WALTER H. COFFIN read a paper on "A Generalized Treatment of Irregularities" in which he described his own and his father's method of treating cases

by means of vulcanite plates with piano-wire springs attached. Piano-wire as a means of exerting force by virtue of its great resiliency and strength had been employed by Headridge for several years, and vulcanite base-plates were not new, but the combination of the two materials in the manner devised by Mr. Coffin was decidedly original and effective.

In the variety of its application and its consequent scope of usefulness it seemed to open up a new field in orthodontic practice. Mr. Coffin designated his method the "expansion method" for the reason that the bringing of malposed teeth into alignment, in nearly all cases necessitated the expansion or enlargement of the arch for their accommodation. This expansion was accomplished coincidently with the application of force to individual teeth so that both operations were carried forward without loss of time. Other advantages possessed by the method were the firm anchorage of the plate when in position; its large field of resistance; the facility with which the wire springs could be attached to it, and its complete supplanting of the use of screws, levers and ligatures. Its simplicity of construction and operation, conjoined with its almost universal applicability, won for it immediate favor. Fig. 20, represents an upper plate designed to expand the arch and at the same time bring into alignment an out-standing upper lateral incisor. The plate is fashioned to cover the entire vault and the posterior teeth, the latter to afford firm anchorage and to open the bite so that the movement of the malposed tooth may not be interfered with. While the plate is in process of construction, a piano-wire spring coiled a few times upon itself is imbedded by means of its free ends in the body of the plate, the main portion of the spring resting entirely upon the surface. Any additional spring for individual movement is also placed in position. After the plate has been constructed in one piece, it is slit with a jeweler's saw along its center into two symmetrical halves. By pulling these halves apart from time to time, thus widening the spring, and reinserting into position in the mouth, force is exerted laterally resulting in arch expansion. At the same time any supplemental spring or attachment is accomplishing its object independently.



Fig. 20
Coffin Expansion Plate (upper)

For the lower teeth the plate assumes the form of a horse-shoe, with plain, curved, double wires passing along the lingual portion, as in Fig. 21.

By a suitable arrangement of springs and wires adapted to the necessities of each case, the expansion of the arch in any direction, and every desired movement of the teeth, may be brought about.

In the following year (1882), J. J. R. PATRICK¹ devised and introduced his

novel method of aligning the teeth of either arch. The appliance, seen in



Fig. 21
Coffin Split Lower Plate

Fig. 22, consisted of a half-round gold and platinum wire bent to the form of the arch and extending its full length. Fitting this arch snugly, but capable of sliding upon it, were a number of sections cut from half-round gold tubing. To two of these slides gold bands fitting the anchor teeth were soldered, while to the others, loops, hooks, wedges or any

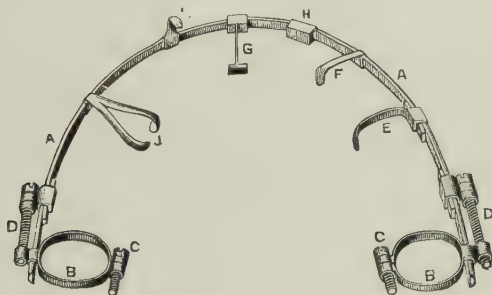


Fig. 22
Patricks' Arch and Attachments

desired accessories were attached. To the buccal surface of the slides joined to the anchor bands were fitted screws with convex heads, which operated against the arch wire to hold it firmly in position.² The operation of the appliance is described as follows:

"The apparatus acted as a lever of which the power is the elasticity of the bow-spring, the fulcrums the points used for anchorage, and the resistance the tooth or teeth to be moved. If these are outside the arch, the bow-spring is adjusted so that its flat surface touches all of the projecting teeth, and is firmly

¹ Dental Cosmos, Vol. XXIV, p. 480. Paper read before the Illinois State Dental Society.

² In 1887 Dr. Patrick substituted screw clamp-bands for the plain gold anchor bands as shown in cut.

set with the set-screws. The wedges are then forced together between the teeth to be moved and the bar; should the wedges cease to act before the teeth are properly placed, the set-screws are loosened, the wedges separated and the bar taken up until its inner surface is again pressed against the projecting teeth, when it is firmly set and the wedges brought into play. To move teeth outward, the elasticity of the bow-spring is made to draw upon them by means of the proper appliance. Rubber bands or ligatures may be made useful auxiliaries. Should the bar at any time exhibit a tendency to slip toward the gum, it can be held in its proper place by snapping one of the slides provided with a hook over the cutting edge of a tooth." As will be seen, this mechanism comprises all, or nearly all, of the valuable features that are found in the present-day "expansion-arch." The stiffened gold wire, once bent to form, provides the outline or guide to which the teeth are moved to conform, while its elasticity provides the power for either expanding the arch or the moving of individual teeth. The slides with their attachments furnish the means for grasping the teeth to be moved outward, or by the wedgelike additions, for forcing others inward, while the bow-wire is capable of adjustment as to length by the set-screws.

It was undoubtedly the first appliance devised for producing a great variety of movements, and while it was not largely adopted in practice, it certainly was the prototype of the similarly operating appliances in use today.

In April, 1887, before the New York Odontological Society, there was read a paper prepared by I. B. DAVENPORT of Paris,¹ on "The Significance of the Natural Form and Arrangement of the Dental Arches of Man, with a Consideration of the Changes Which Occur as the Result of Their Artificial Derangement by Filing or by the Extraction of Teeth."

The profession had passed through the experience of and discussion upon Dr. Arthur's method of filing the teeth on their approximal surfaces to prevent the extension of caries, and the practice had for some years been discontinued. So, also, the once common practice of extracting certain teeth, usually the first permanent molars, either to prevent approximal decay or for the purpose of relieving a crowded condition of the arches, had for years been discussed and had come to be largely abandoned, but both practices had been considered and discussed from the standpoint of a desire to benefit the teeth in a general way and to promote their efficiency.

The relation which such filing or extraction might bear to the efficiency of the masticatory apparatus as a whole had not yet been publicly considered, and it was the object of Dr. Davenport's paper to discuss this relationship and

¹ Dental Cosmos, Vol. XXIX, p. 413.

point out its great significance. While probably not so considered by its author, it was in very truth an epoch-making paper because it brought to light fundamental facts which had hitherto been overlooked and which, by virtue of their importance, opened the way for marked changes in dental procedures. After presenting the anatomical features of the individual teeth, their relation to one another and the manner in which the occlusion of the upper and lower teeth served the best purposes of speech and mastication, Dr. Davenport proceeded to show how any change of form in any of the teeth, or the loss of one or more teeth, so disturbed the normal relationship as to greatly lessen their efficiency, favor decay and produce inharmony of the features. After showing numerous plaster models, divided so as to expose the occlusion of the inner cusps of the side teeth as well as the outer ones after their relationship had been altered by extraction and their efficiency consequently lessened, he says:

"But why extract at all? For, besides the loss of important organs we shorten the bite, contract the mouth, disturb the facial expression and secure at least an arrangement of the teeth less favorable for their preservation than existed at first."

While admitting that under unusual conditions slight extraction may sometimes be resorted to with favorable results, he strongly condemned the practice in general and makes the following significant declaration, "I am forced to believe that far more irregularities have been *caused by extractions* than could ever have been *corrected by extraction*."

In another important paper read before the American Dental Society of Europe, in 1891,¹ entitled, "Articulation of the Teeth," Dr. Davenport amplifies his views in regard to what constitutes correct or normal articulation (occlusion) and the importance of trying to secure it in all regulating procedures. He says:

"Largely on account of bad articulation irregular teeth tend to become more irregular. * * * Much harm is usually done by the use of regulating appliances which change the articulation without improving it, and it is almost a universal fact that unless an improvement can be made in articulation there will be no permanent improvement in the irregularity. Finally, *the articulation is the only permanent retainer to be depended upon.*"

Here we see for the first time the declaration (since then so generally accepted) that only by re-establishing normal occlusion can we hope to secure permanently satisfactory results in regulating.

In 1887, V. H. JACKSON, who had previously used other appliances in

¹ International Dental Journal, Vol. XIII, p. 1.

regulating, introduced what he termed a "crib," designed as an anchorage attachment for plates of various kinds. It consisted of a round iridio-platinum wire bent to fit and hug both the lingual and buccal surfaces of the side or posterior teeth near their necks, with connecting wires passing between or over the occlusal surfaces of these teeth. It was designed, and at first employed exclusively for retaining purposes, but its use was afterward extended so as to make it serve as a base for regulating devices constructed solely of wire and operating upon the spring principle. In his practice it soon superseded the use of vulcanite plates, jackscrews and other previously used devices, and became the foundation of the system which has since been associated with his name. In appearance his crib somewhat resembled the devices of Delabarre and Schange, although those were used principally for temporarily opening the bite. The various ways in which the wire and spring idea has been carried out in the Jackson appliances are almost numberless, but in principle they consist of the bent wire crib for anchorage, a heavy base wire extending around the inside of the arch, to which the cribs on each side are attached and the supplementary short wires or *finger springs*, which exert direct force upon the teeth to be moved and which are united to the base wire. In the gradual development of the appliances the iridio-platinum wire gave way to the employment of piano-wire on account of its greater power and lesser bulk, but this has since been superseded by German silver containing a large percentage of nickel. Inasmuch as time has proven that the Jackson appliances in their varied forms are capable of producing any of the desired movements in regulation, and serve equally well in the matter of retention, the following claims made by the originator of the system seem to be justified:

1. Ease of construction and alteration.
2. Firm anchorage.
3. Occupation of little space in the mouth and hence least interference with speech and mastication.
4. Cleanliness; the patient being able to remove and insert the appliance.

Dr. Jackson was one of the early advocates of continuous pressure in preference to intermittent pressure so strongly advocated by Dr. Farrar. Using the springiness of metals as his sole source of power, Dr. Jackson's methods are in strong contrast to those of all other prominent orthodontists, most of whom avail themselves of a variety of power-producing appliances. In another respect also, Dr. Jackson stands out in contrast with his fellow specialists. While the question of the relative advantages of removable and non-removable appli-

ances has been discussed for many years, with the great bulk of opinion strongly favoring the latter, Dr. Jackson has consistently held from the first that the removable appliance is the only one that can assure cleanliness and freedom from tooth-injury and that in the case of retaining appliances these features are of the utmost importance. In 1904, Dr. Jackson published his book, entitled "Orthodontia," containing a full exposition of his system and methods from the beginning of his work down to the date of publication.

The "American System of Dentistry," published in 1887, contained a chapter on "Orthodontia" prepared by S. H. Guilford. Covering some fifty pages, it treated the subject more comprehensively than had yet been done by any writer in the United States except Dr. Kingsley. While it described and illustrated some appliances that were original with the writer, very full descriptions were given of the various systems of regulating which up to that time had been brought to the attention of the profession. It also contained a formulated set of rules governing the application of force, and another set by which to determine whether or not extraction should be resorted to in cases presented for treatment. At the request of the National Association of Dental Faculties, Dr. Guilford prepared a text book on "Orthodontia" for use in the schools of the association and published it in 1889. It was intended for the student rather than the practitioner, and with that in view the matter was arranged in progressive form, leading from the simplest beginnings up to the practical treatment of the most difficult cases. It was adopted by most of the schools of the association for use in their institutions and was the first textbook upon the subject ever published. Successive editions followed in 1893, 1898 and 1905, each one including the principal advancements made in the science between the issue of the editions.

Before the Ninth International Medical Congress Section of Dental and Oral Surgery, held in Washington, D. C. in 1887, several papers were read on the Correction of Dental Irregularities, among them one by E. H. ANGLE, entitled "Notes on Orthodontia."

After discussing the importance of operations for irregularity, the principles involved and the movements to be produced, the writer presented "a few simple appliances for accomplishing the different movements of the teeth and retaining them when in desired position." These appliances were "a small jack-screw" made of Stubbs steel wire, "a traction screw" made of the same material, and a "rotating appliance," the latter being composed of a platinum Magill band to be cemented to the malposed tooth, with a metal tube soldered horizontally to its face into which was fitted a length of fine piano wire to act

as a spring or lever in rotating the tooth. For retention, a small piece of gold-plated wire was passed through the tube, secured by a pin and allowed to rest upon an adjoining tooth on each side.

This was the simple beginning of what later developed into an elaborate system of regulating known as the "Angle system," the central feature of which is a wire arch, conforming to the normal outline, operating in buccal tubes attached to anchor bands on the molars and designed either to expand the arch by virtue of the elasticity of the wire or to move individual teeth through the agency of wire ligatures which join the teeth to the arch, causing them to move in accord with its movement. The development of the system also included the devising of a number of delicate instruments and accessories for the attainment of more satisfactory results in regulating.

Dr. Angle's first set of appliances was patented in March, 1889, and placed on sale by the Wilmington Dental Manufacturing Company, other patents following as the system developed. Five different series or editions of pamphlets describing the system were also issued between 1889 and 1897.

In 1900 Dr. Angle published his first elaborate volume, entitled "Treatment of Malocclusion of the Teeth and Fractures of the Maxillae," in which he set forth clearly and at length his methods of operating, including the devices which he had designed, with their methods of construction and operation. Aside from the inherent merits of the work in general, its value was greatly enhanced by the numerous photographic reproductions of models showing the various cases before and after treatment.

In 1907 another edition of the work was published, more elaborate and comprehensive than the first, containing all of the advances made by the author in the intervening years. In pamphlet No. 3, published in 1892, Dr. Angle illustrates and describes his "Adjustable Clamp Band," which has ever since been an important feature of his own and some other systems. In pamphlet No. 4, published in 1895,¹ he advocates the use of soft brass wire for ligatures instead of silk, and describes his method of using it. In 1899,² he brought out his device, known as the "friction sleeve nut," to prevent the accidental unscrewing of nuts on regulating devices, and later adopted and extended the use of the "Baker Intermaxillary Elastics" for producing reciprocal movement of teeth in both arches.

Dr. Angle was the first publicly to emphasize and incorporate in his writings and teachings the views of Davenport, both in reference to the non-extraction of teeth for purposes of regulating and the importance of restoring normal

¹ Also see *Dental Cosmos*, Vol. XLIV, p. 454.

² *Dental Cosmos*, Vol. XLI, p. 863.

occlusion in order that the best results might be obtained and permanently retained.

In a paper published in 1902,¹ Dr. Angle strongly advocated the separation of orthodontia from general dental practice and its establishment as a distinct specialty. For some years he had already devoted himself to its exclusive practice, and soon afterward opened a school of orthodontia for the training of dentists for the practice of this specialty.

Dr. Angle is also the originator of a classification of irregularities based upon the different varieties of malocclusion. The different types are placed in groups and for each group is prescribed a definite line of treatment. The arrangement is orderly and scientific and has been accepted and adopted by a large proportion of the profession.

In 1888, E. S. TALBOT published his first work on "The Irregularities of the Teeth," which, besides matter never before published, included the substance of articles previously printed in the "Dental Cosmos."

While covering the usual subjects of anatomy, etiology, classification, etc., a generous portion of the work was devoted to the practical treatment of cases, describing the different systems then in vogue, the proper application of force, the mechanical principles involved in the operation and the various methods of securing permanent retention.

Of his own devices the author described and illustrated his coiled spring for expansion of the arch or for the movement of individual teeth. By an ingenious modification it was also made to serve in the "compulsory eruption of teeth." Dr. Talbot also advanced and advocated surgical correction by removal of alveolar tissue in the path of the moving teeth. In the second edition (1890) the subjects treated of in the first edition were elaborated along the same lines, but in the third edition (1894) the practical features of treatment were almost entirely subordinated to etiology, in which the author had become increasingly interested. The fourth edition (1901) devotes much space to the elaboration of the author's belief that irregularities of the teeth are for the most part of constitutional origin, with degeneracy, race-mixture and developmental neuroses as prominent factors. The practical features of this edition are more extensive and elaborate than those of former editions, although the author confines himself largely to apparatus of his own devising.

While Dr. Talbot may not have made very great contributions to the me-

¹ Dental Cosmos, Vol. XLIV, p. 905.

chanical treatment of irregularities, his extended researches through thirty years as to the main factors in the production of dental disarrangement, have produced results which have had large influence in advancing both the science and practice of orthodontia.

In the spring of 1893 H. A. BAKER devised an appliance for "correcting protruding and receding jaws," which, while exceedingly simple, was destined to become far reaching in its application to the correction of certain types of dental irregularities.¹ It was designed to meet the conditions of a child of twelve years whose lower jaw had failed to develop in harmony with the upper, thus presenting a decided case of lower retrusion. All of the lower teeth occluded one step back of their normal positions and the problem presented was that of moving these teeth forward *en masse* and obtaining a suitable means of anchorage within the mouth from which to exert the necessary force.

A careful study of the case led Dr. Baker to the conclusion that by joining the upper teeth together they would serve as an anchorage, and that by also joining the lower ones so as to cause them to move as one body and applying suitable force between the two jaws, the teeth might be brought into normal relation. He therefore adjusted a wire arch to the upper teeth and a similar one to the lower. Then by slipping an elastic rubber band over the end of the tube on the lower molar anchor band, he carried it forward and tied it to the upper wire arch in the region of the lateral or cuspid. This being done on each side, traction was produced which, in the course of two months, resulted in bringing the lower jaw or teeth forward into normal occlusion with the upper ones. Different means for "jumping the bite" had been devised before, but they were far slower in producing results and much more complicated. Rubber ligatures had also been used before to operate between the upper and lower teeth, but only for the purpose of elongating or extruding an incompletely erupted tooth. This simple method of utilizing intermaxillary force was quickly adopted by practitioners of Orthodontia and was soon found to be equally serviceable in retruding prominent upper teeth or in producing both retrusion of the upper and protrusion of the lower at the same time. Indeed, it completely solved the long considered problem of quickly and easily moving the mass of teeth in either arch into normal occlusion and relation.

The benefits conferred by this simple and effective method may be regarded as constituting a decided land-mark in the progress of orthodontic practice.

At the Columbia Dental Congress in 1893, Dr. C. S. CASE, read a notable paper² on "The Esthetic Correction of Facial Contours," in which he set forth

¹ International Dental Journal, Vol. XXV, p. 344.

² Dental Cosmos, Vol. XXXVII, p. 905.

the possibility and advisability of not only changing the position of malposed teeth in regulating, but also of applying force in such manner, when necessary, as to produce anatomical changes in the bony tissue adjoining the teeth, thus bringing the parts into harmonious and esthetic relation with the other features.

To do this it would be necessary to move the roots of the teeth as well as the crowns so that any overfulness or deficiency in the root region would be changed to a condition of normality and harmony.

This root movement, either labially or lingually, he accomplished by devising a method of applying force well up opposite the roots of the teeth, which served the same purpose as though the roots themselves were operated upon directly by the mechanism. This was accomplished by soldering short stiff bars to the bands upon the teeth to be moved and having these bars extend upward outside of the gum to a point midway of the length of the roots. Force exerted in a lingual direction by means of an arch wire passing over these bars near their free ends and operating through a tube attached to the molar anchor bands would compel lingual movement of the roots, whereas force applied in the opposite direction, by having the arch wire press against the under sides of the rigid bars, would force the roots in a labial direction. In either case the moving roots would carry with them the surrounding alveolar tissue producing the anatomical changes desired.

The paper was accompanied by models showing how such movements had been accomplished in actual cases in practice. A paper of similar purport had been read by him before the Chicago Dental Society, in February of the same year, describing a case operated on along these lines during the previous year.

Besides the root movements in this first case the entire mandible needed retracting and this was accomplished, or at least aided, by the use of intermaxillary elastics operating between buttons attached to the upper and lower appliances.

It will be noticed that both Dr. Baker and Dr. Case first employed the intermaxillary elastics at nearly the same time but there was this slight difference in the two procedures; Dr. Baker employed the elastics for the sole purpose of protruding the mandible and effecting a normal occlusion, while Dr. Case employed them to retract the mandible and as an auxiliary to an operation for the labial movement of the upper incisor teeth and roots.

In March, 1904, before the New York Institute of Stomatology, a paper¹ was read by G. C. AINSWORTH, describing "a new appliance for moving dis-

¹ International Dental Journal, Vol. XXV, p. 481.

located teeth into position." In reality three appliances were described, consisting of "a self-acting spreading appliance," "an inclined plane for jumping the bite and adjusting the occlusion," and "a simple retaining appliance." The first and most important one consisted in forming metal bands to a single tooth on each side (usually a bicuspid), and to the band on its lingual surface soldering an extension wire to rest against a tooth anterior and one or two posterior to the band. This arrangement made possible the moving of several teeth by the employment of a single band. To the buccal surface of each band was soldered a piece of seamless metal tubing about three sixteenths of an inch in length and set vertically. Thus arranged each band was cemented in place.

The power-producing factor consisted of a piece of hard-drawn German silver wire (18 per cent nickel), 16 gauge, curved to conform to the anterior part of the arch and long enough to extend somewhat beyond the anchor teeth. Each end of the wire was then bent into the form of a double curve, so that when these vertical ends were slipped into the tubes on the anchor bands the wire arch would touch, or nearly touch, all of the teeth in its course.

In operation, the wire arch was straightened to form a larger curve, then pressed into position, when the elasticity of the wire would exert a constant force resulting in the buccal movement of the teeth on each side included in the operation. Increasing force could be obtained from time to time by removing the wire arch, flattening its curve and reinserting it in position. If the anterior teeth were to be retruded coincidently with the widening of the arch, it was easily accomplished by bending the spring wire so as to rest tightly against the front teeth. If a single tooth on one side was to be moved buccally, no extension was made on the lingual side of the band encircling it, while on the opposite side sufficient resistance was obtained by including several teeth as before described. After completion of the operation retention was had by simply substituting a wire with little or no spring for the one that had accomplished the movement.

The simplicity and efficiency of the appliance with its few parts and ease of construction placed it in striking contrast to the more elaborate and conspicuous appliances commonly used to bring about the same results.

During the meeting of the Fourth International Dental Congress, Section of Orthodontia, in August, 1904, C. A. Hawley presented a paper¹ entitled "Determination of the Normal Arch and Its Application to Orthodontia."

Taking as a basis Dr. Bonwill's geometrical figure of the equilateral triangle, in which two sides represent the distance from the contact point of the

¹ Dental Cosmos, Vol. XLVII, p. 541.

lower central incisors to the center of each condyle and the third side the distance between the center of condyles, the writer proceeded to show that the arc of a circle, drawn with the combined diameters of a central, lateral and cuspid tooth as a radius, the curve of the front part of an arch in any normal case would be accurately represented. Then, if another line were drawn from the point representing the distal surface of the cuspid to the condyloid angle of the triangle, this line would pass through the crests of the buccal cusps of the bicuspid and the disto-buccal cusps of the molars.

This being the guide as to normality, it was argued that by measuring the diameters of a central, lateral and cuspid of any plaster cast representing a case for orthodontic treatment, a figure could be drawn upon cardboard according to the outlined plan, which would accurately represent the arrangement and form of arch that should be produced in the patient to represent normality. In this way it was said any practitioner, and especially an inexperienced one, could supply himself with a visible and accurate guide to be followed in his rearrangement of the malposed natural teeth.

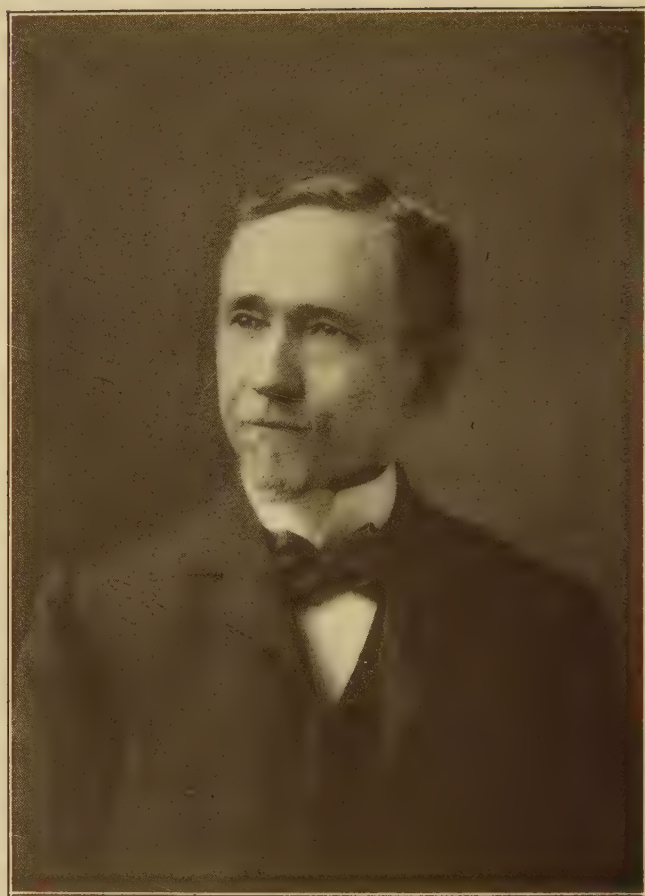
In a later presentation of this subject, Dr. Hawley said he had found that the variations in width of the anterior teeth did not cover a very wide range and that, therefore, diagrammatic card charts could be prepared in limited number, each representing a certain width of anterior teeth, and that in any proposed case of regulating by measuring the widths of the anterior teeth and selecting the chart representing such measurement, the practitioner would have a guide ready for his purpose.

A later suggestion was that the guide cards be prepared of transparent celluloid, which could be laid upon the plaster cast from time to time to see that the movements being produced were in accordance with the design.

The idea of Dr. Hawley is a novel one and seemingly possessed of merit, but whether it will be generally adopted can only be determined by time.

In thus reviewing the history of Orthodontia it will be noticed that greater advancement in both the art and science of this important specialty has been made in the last twenty years than in the fifty years preceding. Instead of the random attempt to move a misplaced tooth into alignment which once seemed to be the sole object of the operator, the practitioner of to-day takes a broader view and is concerned not so much with the movement of individual teeth as with the restoration of alignment in both arches and establishing a condition of normal occlusion which shall not only subserve the best purposes of mastication but also restore the harmony of the features.

The possibilities in Orthodontic practice, as they exist to-day, have served to elevate dentistry to a higher plane in the estimation of the public through the manifest benefits which have been conferred by rational and scientific treatment.



William H. Larneman,

Dental Journals of the United States

William H. Trueman, D. D. S., Philadelphia, Pa.

It is fortunate, indeed, that dental journalism made its advent in the United States, for nowhere else in the wide world were conditions so favorable. Although the educational institutions of the American people may not have reached as high a standard as those of longer settled communities, nevertheless, the well ordered public schools made education far more general, and the liberal facilities for distributing general literature made the nation preeminently a nation of readers. No sooner was the first dental journal well launched than others were quickly projected; the dentist who contemplated "writing a book" became an editor, and supplied his patients with monthly "Dental Visitors"; quarterly, or semi-annual "Dental Mirrors"! or a "Family Dental Journal," now and again. Mr. Stockton, of Philadelphia, issued his monthly advertising sheet, "Stockton's Dental Intelligencer," and others in the same line followed his example. Some of these remained as they began, mere advertisements; others have developed into professional journals of which any calling however exalted may justly be proud. The publishers of these journals have generally been liberal in sustaining them, and have as far as possible kept the business and scientific sides separate and distinct. They have selected as editors men of recognized ability and professional standing, and have observed all the requirements of professional ethics.

Now and again sporadic attempts have been made to establish dental journals separate and apart from any business association. Their projectors have failed to realize that a dental journal when ready for its subscribers becomes a commodity, notwithstanding its strictly professional association. It must not only have merit, but it must also have some recognized channel to reach those on whom it depends for support and maintenance. Were the

financial side well provided for, there would still remain an equally important matter effecting its usefulness, the means of reaching appreciative readers. It is this that will make or unmake the best dental journal that can be produced. A dental journal which reaches no further than the shelves of a warehouse, no matter what may be its merit, is so much waste paper. Were the dental profession thoroughly organized, then a journal published as part of its organization machinery would have an assured circulation as large as the members of the profession are numerous. It could command writers, employ the best editorial talent and attract a profitable advertising patronage. Without this open door to acquire and maintain sufficient circulation to make it profitable to its owners and useful to the profession, the publication of a dental journal calls for a business energy, tact, and persistence that is not as yet, and possibly never will be available outside of business ownership. It is not altogether apathy of the profession that has made such enterprises discouraging failures; it is rather due to the fact that the business end of the enterprise has not been efficiently provided for. Professional ideals are too often dreams; professional men have not the business capacity, push, and energy, to make real, especially when they are side issues to an exacting and laborious calling. A business house making the publication of a dental journal a side issue, can, with the least possible expense, manufacture and market a professional journal as readily and as successfully as it can its other products.

In this sketch of dental journalism in the United States, no attempt has been made to include all the journals that have been published. Many have come and gone, making no impress upon the profession. Of those now published, a number are of but little interest outside of a limited circle, such, for instance, are the college, fraternity, and advertising journals.

The "American Journal of Dental Science," and the "Dental Register of the West," were preeminently the pioneers of American dental journalism, one of the east and the other of the west. The first ended its short career of twenty years at the death of its founder; the other still lives, after more than threescore years of usefulness. The men who so nobly, and at so serious a financial loss, maintained these two beacon lights of dental education well earned the profession's grateful esteem.

The closing years of the fourth decade of the last century were eventful ones in the history of dental science, especially eventful in the history of that science in the United States. The more prominent members of the dental profession in the United States were beginning to feel the need of

some better means of communicating one with another, of a closer intercourse, and a more general, and a more frequent interchange of information gained by observation and experience. Neighborly courtesy and personal correspondence were found too restricted, and the writing and publishing of dental books far too cumbersome and expensive to meet the growing needs of a profession rapidly increasing in numbers and importance. While the public press, the medical, and many scientific journals, were ever ready to receive and to publish well written dental articles, and for several centuries were freely used by dental practitioners to make known their observations and discoveries, their circulation among members of the dental profession was limited, and the time came when the profession felt strong enough to inaugurate a journal entirely its own.

In no part of the world was the dental profession so strong, so independent, or so progressive as it was in the United States. The country was young, and its rapid development made an open door to every profession and calling. Education and wealth were far more evenly distributed than it usually is in long settled communities; and, furthermore, class distinctions and birthrights were unknown. This made an open way for those possessing ambition, ability, and energy to reach any position to which they aspired. The pace was set in all avenues of human activity in the United States by men with "push." This was especially felt in the dental profession. Old methods were remodeled and made more effective, and new and better ones invented. The ideal was constantly moved forward; more and more was attempted, and more and more accomplished. This constant and wide spread, rapid progress, accompanied as it was by a growing professional comradeship, hastened the advent of dental journalism, and made the United States its birthplace.

It is generally recognized that Horace H. Hayden's was the master mind pushing forward the movement which was rapidly bringing about an important advance for the dental profession. In Chapin A. Harris, young, ambitious, full of energy and thoroughly equipped mentally, he found a very willing and earnest coworker. In New York, these two progressive men were encouraged by representative dental practitioners able and willing to assume the financial burdens, while here and there throughout the country encouraging words and substantial assistance was freely tendered. The scheme in hand was a comprehensive and daring venture; it contemplated raising an honored and respected calling to the dignity of a profession, and sending it forth fully equipped. The first care was a journal wholly under

their control, and having for its object the advancement of dental surgery as a science and as a profession. Their second, to organize dental practitioners of standing and recognized ability into an association for the advancement of professional interests, and third, and last, to institute a professional school. All this was quickly accomplished, so well was it all planned, and the dental profession came into being.

An association was formed in New York for the purpose of publishing a dental journal, and this association appointed as its publishing committee Eleazar Parmly, Elisha Baker, and Solyman Brown, who promptly issued an address and prospectus under date of June 1, 1839, outlining the project. The journal was named the "American Journal of Dental Science"; it was to be published monthly, at a subscription price of three dollars per annum for a single copy, or two dollars and fifty cents when more than one copy was taken.

The advent of the Journal was announced by the following address of the publishing committee to their professional brethren throughout the United States of America, dated June 1, 1839.

Gentlemen:

The period has at length arrived when the profession to which we belong assumes a commanding position in the public eye, and challenges successful rivalry with other useful and profitable avocations of men. This fact is not less auspicious to society at large, than to the professors of dental science, and practitioners of the dental art.

Even the members of the medical profession, so proverbial for their reluctance to encourage innovations in the healing art, are beginning to discover the importance of our cooperation in mitigating the woes, and protracting the duration of human existence. The achievement of this object is to be ascribed to the noble spirit of virtuous enterprise with which the present age is inspired, and which we see displayed in every department of human industry and skill. If this spirit is sometimes developed in excess, as when the splendid steam-vessel, ploughing in majesty the billows of the ocean, is followed by the stupid steam-doctor, digging the graves for his victims on the land, it is nevertheless, the consecrated agency by which the destinies of the world are to be gloriously accomplished, and which already has so far transformed the aspect of society, that, could the man who has slept for the last half century, be awakened from his slumbers, he would hardly recognize the world in which we live, as the place of his original abode.

These magnificent results, to appreciate which the man of the present day must traverse oceans by the energies of fire, and fly over plains and mountains on the wings of the wind, are the products of human industry, goaded by a restless enterprise, and guided by restless genius.

Whether this industry, enterprise and genius are peculiar to the present age, or whether the existing conditions of the sciences and arts is the ultimate result of a

series of predisposing causes, which have been operating for ages past, is a matter of little moment. It is quite sufficient for our happiness and mutual congratulations, to know that we live in an age of unparalleled improvement in all that can result from the energies of intellect acting upon material nature, or from the reaction of matter upon the human mind.

In this condition of civilized man, and of all those arts and sciences which embellish life, imparting to it argumented zest and increased duration, it is our happiness to know that neither the theory, or the practice of the dental art, has been left behind the age, either by the incompetency or inactivity of those individuals to whom in the progress of events, its destiny has been intrusted. If there be any class of men in these States who have "compassed sea and land," in the pursuit of usefulness, fame and fortune, braving obliquy, and resisting opposition, enduring fatigue, and dispising danger, there are surely among our collaborators men who stand in the foremost rank of these benovolent adventurers. Nor have they exerted themselves in vain. Ample fortune and enviable celebrity have already rewarded the spirited zeal of many laborers in this wide field of professional enterprise; while the improved condition of our art, as regards its salutary influence on society at large, is proof of the justice of the desert which has been munificently rewarded.

What encouragement, then, in this, to increased exertion in this field of useful labor, and honorable distinction! Who would not prefer to attend these distinguished pioneers in the paths of dental science and share their rewards, than to follow the Cæsars and Napoleons of past ages to their fields of blood, and their untimely graves?

Presuming that many of those individuals, to whose professional interests this work will be devoted, must feel as we do on the subject of elevating the dental science to its deserved position among the callings of men—and feeling confident that where much has been already done, still more remains to be effected, the publishing committee have issued this specimen number of a monthly periodical, dedicated to the profession at large, with a perfect conviction of the obvious truth, that by their prompt encouragement or silent neglect, it must either stand or fall. That any other class of our fellow citizens, excepting, perhaps, an inconsiderable portion of the medical profession, will afford the least encouragement to the present undertaking, is beyond our hope. The details of dental practice, and even the more sufferable theory of our art, possess an absorbing interest chiefly with the more intelligent and ambitious of our own profession; and it is to them, therefore, that we now appeal, by first presenting an expose of our general plan, and then suggesting a few brief considerations to induce our professional brethren to cooperate in our design.

Then followed a long list of particulars giving with much detail the plans and hopes of the publishing committee. Thus was ushered into the world the first dental journal.

The first article was a review, by Solyman Brown, of Chapin A. Harris' first work, entitled "The Dental Art," really the first edition of his well known and much appreciated "Principles and Practice of Dental Surgery." This was followed by a lengthy extract from a translation of "Delabarre on Second Dentition," by Dr. Harris: an account of a remarkable tooth, by E.

Baker; an extraordinary instance of the force of hereditary principle, by Solyman Brown; an announcement that the publishing committee had been tendered the loan of a dental library by Mr. Eleazar Gidney, a dentist of Manchester, England; a remarkable case of osseous union of the teeth, by Eleazar Parmly; an article, copied from a medical journal, entitled "Anatomical Discovery—The Ligamentum Dentis," by J. F. Flagg, of Boston; and a catalogue of Mr. Gidney's library, some seventy-six volumes, embracing nearly all the French and English dental publications of note.

This first number contained twenty-four pages. Taking it all in all, it was a very creditable production, this first number of the first dental journal. The second number was paged from 1 to 24, thus duplicating the paging of the first. This error was corrected in the third number which begins with page 49. The fourth number is embellished with a steel-plate portrait of John Greenwood, engraved by the renowned Roy Peintre, of Paris, whose work is now much sought after by collectors. At the end of this number is a list of subscribers, from which we learn that it had about one-hundred and seventy-five subscribers taking five hundred copies. It was indeed a very good beginning, and the projectors of the journal were very much encouraged. The seventh number is of special interest in that it gives a full account of the organization of the American Association of Dental Surgeons, not the first dental society organized, for several short-lived ones preceded it, but the first to make an impress upon the profession, and to practically demonstrate to dental practitioners the advantage of frequently coming together for the purpose of a mutual interchange of experience. The proceedings of the convention which organized the society, and the society's constitution and by-laws in full, seems to have so enlarged this number that number eight was omitted; numbers nine and ten were issued together, as were also numbers eleven and twelve. This completed the volume. None of the numbers were dated. It is not probable that the undertaking was profitable; it was not expected to be. Its friends in New York made themselves responsible for any financial loss the first year.

It was part of the general plan of the publishers of this journal to reproduce from time to time works which they considered meritorious exponents of dental science. It is to aid in this that Mr. Gidney loaned them his dental library. These were not published as part of the journal, but in connection with it as separate and complete works, properly paged and indexed for binding apart from the periodical. Carrying out this idea, appeared as first of the series, "The Natural History of the Human Teeth,"

by John Hunter, with notes by Eleazar Parmly, and embellished with a creditable portrait of Hunter. This was followed by Dr. Solyman Brown's "Dentologia, a Poem on the Diseases of the Teeth, and Their Proper Remedies."

The year's work of these progressive members of the dental profession was well done. The journal loses nothing by comparison with other scientific journals of the day, and as the work progressed it was plainly to be seen that it was accomplishing the object for which it was designed. It brought the members of this great profession nearer together, and taught them that it paid to make the results of observations and experiences common property. Dentists the world over cannot too highly commend the unselfish devotion of those who voluntarily assumed the financial burdens, the responsibilities, and the unremunerated labor of giving to the world its first dental journal.

Beginning with the second volume, September, 1841, the newly organized American Association of Dental Surgeons took charge of the enterprise as part of their work, and Drs. Chapin A. Harris and Solyman Brown were appointed editors.

Its new owners increased the subscription price to five dollars, and made it a quarterly instead of a monthly; the volume, however, contained a few more pages (304). With the first number of the second volume appeared a lithographic portrait of Dr. Hayden, from a painting by Rembrant Peale, executed 1825, and believed to be the only portrait extant of this distinguished man. In the number for September, 1841, is found a well executed colored lithograph of the pulp of a bicuspid tooth from a drawing by Mr. Charles Brown, of Woolwich, Kent, England, showing a highly congested condition. It is nine inches long, and was drawn, Mr. Brown states, from the specimen under the microscope. Another well executed colored lithograph illustrates an article on the vascularity of dental bone, by Dr. Chapin A. Harris. In this volume Dr. Solyman Brown began a series of articles on "Mechanical Dentistry." They were well up to date, written by a thoroughly practical man, and were much appreciated. For some years they were considered the best contribution to that subject in dental literature.

With the new volume the title was changed to read, "The American Journal and Library of Dental Science." This addition to the title was dropped at the close of the volume. During the year a treatise on "First Dentition," by M. Baumes, translated from the French by Thomas E. Bond, Jr., M. D., and "Principles of Dental Surgery," by Leonard Koecker, M. D.,

D. D. S., embellished with his portrait, were published as part of the library.

The third volume was edited by Drs. Chapin A. Harris, Solyman Brown, and Leonard Mackall. It was embellished by portraits of Dr. Eleazar Parmly and Mr. Alexander Nasmyth, a distinguished London dentist. Among the notable contributions are five articles by Dr. Brown, completing his work on "Mechanical Dentistry"; a list of officers and members of the American Society of Dental Surgeons; and a "Dissertation on the Maxillary Sinus," by Dr. Chapin A. Harris. A treatise on "Diseases of the Mouth," by J. B. Gariot, translated from the French by Dr. J. B. Savier, and "Researches on the Development, Structure, and Diseases of the Teeth," by Alexander Nasmyth, were added to the library.

On the editorial staff which prepared the fourth volume, Dr. Maynard replaced Dr. Mackall. In this volume will be found, on page 221, an extended obituary of the profession's great leaders, Dr. H. H. Hayden, who died, Friday, January 26, 1844, aged seventy-five years. The works of Thomas Berdmore and David Wemyss Jobson were added to the library during the year.

With the fifth volume Dr. Amos Westcott replaced Dr. Brown on the editorial staff. The proceedings of a convention of dentists held at Cincinnati, Ohio, August 13 and 14, 1844, which organized the Mississippi Valley Association of Dental Surgeons is reported on page 112. This was a notable association. Among its members were many of marked ability, and earnest, vigorous workers for professional advancement. Moreover, it was the first dental association to celebrate a golden anniversary. After a little more than fifty years of continuous existence, owing to changes within its bailiwick making a different arrangement of society activity expedient, it closed its career.

It will be news to some to know that a law to regulate the practice of dental surgery in the state of Alabama was enacted and approved December 31, 1841; it is found on page 248 of this volume, and is well worth reading.

A translation of "Lefoulon's Theory and Practice of Dental Surgery," translated from the French by Dr. Thomas E. Bond, was added to the library. It is an excellent work.

The same editors supervised the publication of the sixth volume. This volume announces the advent of another notable dental society which has proved long lived. On page 208 is a full account of a convention held at Philadelphia which organized the Pennsylvania Association of Dental Surgeons, December 15, 1845. It is still active and celebrated its golden anniversary by a largely attended banquet in December, 1895. At its next

annual meeting, in October, 1908, it will have completed its sixty-third year, and is the oldest dental society in the world. It has continued its meetings regularly during this long period, and is today stronger in membership than ever before. With this volume appeared as additions to the library a "Treatise on Second Dentition," by C. F. Delabarre, translated from the French by Chapin A. Harris; "A Few Facts Connected with the Teeth," by Mr. George Waite, surgeon-dentist, England; "Anatomy of the Dental System," by Ph. Fr. Blandin, translated from the French by Dr. Robert Arthur.

The seventh volume was edited by Drs. Harris and Westcott, and Mr. Edwin J. Dunning. With this volume, and part of it, was published an article by Mr. Edwin Saunders, a distinguished London dentist, entitled "The Teeth a Test of Age, Considered With Reference to the Factory Children." This work, a little pamphlet, had appeared in London a few years previously, shortly after the British parliament had passed an act forbidding the employment of children under a certain age in factories. The cupidity of parents led to false statements regarding the age of many children so employed. It was to counteract this that Mr. Saunders undertook the investigation. While it is interesting reading, it is questionable whether it had any value in correcting the evil. As it was during the publication of this volume that Dr. Morton demonstrated the value of ether inhalation preparatory to surgical operations, we find it referred to in several articles, but it has much less space accorded it than such an important discovery should merit. This was due, no doubt, to the manner in which it was announced. To many it may be a surprise to know that a number of large and well regulated hospitals refused to use it until long after the demonstration at Boston. Ethics had much to do with this apparent neglect of a valuable means to relieve human suffering. This volume was enlarged to 400 pages. The library was enriched by the excellent work by Desirabode, "Elements of the Science and Art of the Dentist," translated from the French by Dr. Harris.

With volume eight, Dr. William H. Dwinelle replaced Mr. Dunning as coeditor. On page 147 is a paper read by Dr. J. Y. Simpson, before the Medico-Chirurgical Society of Edinburgh, Scotland, announcing his discovery that chloroform was a better agent than ether for producing insensibility to pain during surgical operations. To the library was added "Blake's Structure and Formation of the Teeth in Man and other Animals," a notable book in its day, but hardly worth republication half a century later.

The editors remained the same for the ninth volume. To the library was added a translation of the treatise on "Diseases and Surgical Operations of the Mouth and Adjacent Parts," by M. Jourdain, the first work ever written on oral surgery, published at Paris, in two volumes, in 1778. The translation was made by Dr. P. H. Austen, of Baltimore, his name, however, does not appear on the title page. The "Youth's Dentist," by J. R. Duval, translated from the French by J. Atkinson, surgeon-dentist, was also published.

The tenth and last volume of the first series was edited by the same staff. With it was published the last contribution to the library, "A Practical Treatise on Dental Medicine," by Dr. Thomas E. Bond, the only article of the library that was original, all the others being either reprints or translations. That, revised and enlarged to keep in touch with the advances made in the science, it still continues to be an acceptable text-book in dental colleges, is sufficient evidence that Dr. Bond's foundation work was well done.

About August, 1850, the journal passed into the hands of Dr. Chapin A. Harris, who became its proprietor and editor. The first number of the first volume of a new series is dated October, 1850. It remained a quarterly. The republication of dental works was discontinued. It was enlarged to 571 pages. It required a great deal of courage to shoulder unaided and alone the responsibility of publishing a journal that had not paid its way, but had each year presented to its publishers a deficiency instead of a profit. It is not probable that it proved a paying investment to Dr. Harris. Shortly after Dr. Harris assumed its publication, Dr. Alfred A. Blandy assisted in the editorial work. Beginning with the fourth volume, Dr. A. Snowden Piggott was added to the editorial force.

Beginning the volume October 1st proved inconvenient. The October number of 1854 was, therefore, omitted and the first number of the fifth volume, dated January, 1855, thus making the volume concurrent with the year. With the close of this volume Dr. Blandy's work as editor ceased, and until the close of the publication by the death of Dr. Harris, September 29, 1860, Drs. Harris and Piggott were the editors. The last number of the tenth volume, dated October, 1860, closed the new or second series, and with it the first dental journal in the world's history ceased to exist. (A typographical error in the heading of this number makes it read, Vol. XI).

These ten volumes, the new or second series of the "American Journal of Dental Science," reached a high mark in dental journalism. There was about

them a stateliness and dignity, a professional tone and a scholarship that has not been excelled. The twenty volumes published by dentists for dentists, apart, uncontrolled and unaided by trade or business concerns have a place of honor among dental journals. It is not to the credit of the profession that they were from first to last published at a financial loss.

May, 1867, the firm of Snowden and Cowman, dental dealers of Baltimore, began the publication of a monthly dental journal under the same name, calling it a third series, with Drs. Piggot and F. J. S. Gorgas as editors. While it was considered by its publishers a continuation of the old journal it had nothing with it in common except the name. It was to all intents and purposes a new journal. It was a trade journal. While it undoubtedly filled, acceptably, a place in dental literature, it cannot be considered as occupying a prominent position. With the third volume Dr. Gorgas became sole editor, and so continued until the twenty-fifth volume, when he was joined by Dr. Richard Grady. After the publication of the third number of the thirty-fourth volume, July, 1900, the firm of Snowden and Cowman became financially embarrassed and passed out of existence, and their journal ended its career.

Later Dr. William Gird Beecroft, of Madison, Wis., began the publication of a dental journal, styling it "The American Journal of Dental Science," sometimes as a fourth series, and sometimes as the third, claiming on the title page that it is "the oldest dental magazine in the world." This is much to be regretted, it is not true. This repeated usurping of the honored name of the first dental journal has caused much confusion, it is inexcusable, and serves no good purpose.

That the projectors of the first dental journal were not mistaken in believing there was a need for a dental journal is evidenced by the fact that its advent was promptly followed by a host of others, alike in our own and in foreign lands. Most of them had a limited circulation and were short lived. September 1, 1843, Samuel Wesley Stockton, the first to cater commercially to the needs of the dental profession, and who was then successfully conducting a dental depot at Third and Chestnut streets, Philadelphia, began the publication of a dental journal entitled "Stockton's Dental Intelligencer." The first volume of this consisted of twelve numbers, each of four, six column folio pages. The first number of the first volume was dated September 1, 1843. The numbers were issued regularly each month until June, 1844. The next number, the eleventh of the first volume, is dated May 1, 1845, and the twelfth and last of this volume, June 2, 1845. The second volume, in octavo

form, consisted of twelve monthly numbers, the first dated November, 1845, and the last October, 1846. The third volume of twelve monthly numbers began with November, 1846, and ended with October, 1847. The fourth volume consisted of six bi-monthly numbers. It began with January, 1848, and ended with November of the same year. The publication ceased with this issue. A title-page and index for volumes second and third were issued on the conclusion of volume third; none was provided for volumes first and fourth. This can hardly be considered an important dental journal, although it contained a number of excellent articles scattered through its pages. The octavo numbers contained about twenty-four pages each. So far as the writer knows, but two complete files of this journal exist; one is in a dental library in charge of Dr. S. A. Freeman, of Buffalo, New York, and the other is owned by Dr. Jesse C. Greene, of West Chester, Pa., from whom this information has been obtained. Mr. Stockton's connection with the dental profession was simply that of a business man. He was a watchmaker, but as an amateur he was interested in ceramics, working on the problem of artificially producing precious stones at a time when porcelain artificial teeth were attracting the attention of the dental profession. He was induced to attempt their manufacture, and was remarkably successful. He quickly built up a profitable business and acquired wealth. Tiring of the cares of business, he ceased to give it close attention about the time this journal closed its career, and later retired.

His nephew, Samuel Stockton White, received his business education in Mr. Stockton's establishment, and later a professional training with Dr. John Dehaven White. In connection with his dental practice he opened, in a very modest way, a dental depot. He was young, ambitious, keenly interested in professional matters, and fully alive to the business possibilities catering to the wants of a rapidly growing profession offered. He was of the profession, made its interests his interests, studied its wants, and made it his business to supply all its needs with the best obtainable. He cultivated and maintained friendly relations with his patrons, and joined with them heartily and earnestly in all that tended to advance the educational and scientific interests of the dental profession. His business prospered. Abandoning dental practice, he devoted his whole energies to building up his commercial enterprise. Mr. Asahel Jones, of New York, a gentleman of means, and Mr. John R. McCurdy, a well trained business man, became his associates under the firm name of Jones, White & Co.

The second important dental journal published in the United States,

indeed, the second in the world to survive early infancy, the "Dental News Letter," was projected and brought into being by this enterprising firm, the progenitor of the present S. S. White Dental Manufacturing Company. The "Dental News Letter" was the immediate predecessor of the present "Dental Cosmos."

THE DENTAL NEWS LETTER AND THE DENTAL COSMOS.

The first number of the "Dental News Letter" appeared in October, 1847. It was an octavo of sixteen pages, published by the firm of Jones, White & Company, dealers in dentists' supplies, 273 Race street, Philadelphia. It was a quarterly, subscription fifty cents a year. The object of its publication is set forth in the following valedictory on page 7, of the first number :

Our object in publishing the "News Letter" is, first: that the profession, both in the United States and in Europe, may be informed of the improvements which have been, and are now being made in the manufacture of artificial teeth; the various tools and aids in the workshop, and instruments for the operating room; second: To bring before the profession all that is new in the theory and practice of dentistry, through the medium of original communications, essays from old and young practitioners, collations from authors, and items of news on all subjects relating to dentistry.

No editor is named on the title page. Mr. John R. McCurdy, however, a member of the firm, made the journal his special care, a task for which he was well qualified. He was the business manager of the firm, and by association and correspondence well known to the profession at home and abroad; he was keenly interested in all that tended for professional advancement, and possessed a fair share of literary ability. The first article is a communication relating to the administration of sulphuric ether, by Dr. J. F. B. Flagg, probably the first to discover and make known that Morton's mysterious "letheon" was the well known sulphuric ether, and one of the first in Philadelphia, to make its administration in dental and surgical practice a specialty. The second is a report of a case of "cancrum oris," by C. A. Peck, dentist, of Norristown, Pa.; the next, on the "Effects of Mercury on the Teeth." This is followed by a report of proceedings of the Pennsylvania Association of Dental Surgeons, then just entering its third year, and now well into its sixty-third year of active continuous existence. Another page is taken up with little items, nearly all of the rest are occupied with advertisements of the firm. It was a modest beginning. The firm was young, their means were limited, and they had as competitor the old and well established firm of

Samuel W. Stockton & Company. The first volume had forty-seven pages. The matter presented was varied, and practical at the time it was written.

The second volume was doubled in size, containing ninety-five pages, as also did the third. The fourth and fifth volumes were paged continuously, the two containing 400 pages. This was a large increase in size, and its general "make up" showed improvement. The sixth and seventh volumes contained, each, 252 pages, and the eighth 268. The journal had now an assured place in dental literature. The publishing firm had prospered; they had become the leading dental dealers in the country, and their publication attracted a larger circle of subscribers and dental writers. From the seventh to the twelfth and last volume, it was edited by Drs. J. D. White, and J. R. McCurdy. Dr. White was an accomplished dentist; he was well versed in all that pertained to his profession; an excellent writer; and at this time was at the height of his popularity and usefulness. His editorship gave a tone and character to the journal, and his timely, practical, well written articles increased very much its value to the profession. The remaining volumes had from about 300 to 316 pages of well arranged reading matter. The advertising pages were few in number. The subscription price was raised, as the size was increased, to one dollar, and later to one dollar and a half, a very moderate price, considering that it was nearly all reading matter.

With the last number of the twelfth volume, Dr. McCurdy retired from dental journalism in a nicely worded valedictory. The publishers announced the termination of the journal's existence, and the advent of a monthly publication to take its place, "The Dental Cosmos," under the editorial management of three gentlemen well known to the profession—Drs. J. D. White, J. H. McQuillen, and G. J. Ziegler. Dr. J. D. White took charge of original communications; to Dr. McQuillen was assigned dental literature; and Dr. Ziegler had oversight of medical and general science in their relations to dentistry. This systematizing of the editorial work and enlarging the scope of the journal was the suggestion of Dr. McQuillen. He had earned for himself the reputation of a skillful and painstaking operator; he was a born teacher, and possessed in a marked degree the rare faculty of grasping the abstruse writings of scientific masters, and of revising and making them useful to students. He was ambitious; he had an exalted idea of the importance of his profession, and protested most earnestly that it should not be confined to tooth filling and the mechanical routine of tooth replacement. He urged as it never before had been urged, that the dentist should be a man of science, well versed in all the sciences closely related to his own. His broad

views regarding the future of dentistry are reflected in the name he chose for the new journal, for he it was that chose the name, "The Dental Cosmos." He placed upon its title page the suggestive motto, "Observe, Compare, Reflect, Record," and enforced constantly on his students and compeers the importance of cultivating the studious habits that motto suggests. He was energetic, a tireless worker, self-willed to the verge of obstinacy, and yet so tactful a diplomat as to escape enmity. That his ideas concerning his profession were unpopular; that they were ridiculed by some and condemned by others, passed unnoticed by this born leader of men who demanded for his calling a broader culture and a wider field.

The time was ripe for an aggressive and a progressive move in dental journalism, and fortunate it was for our profession that the opportunity found the man.

The first issue of the new journal appeared in August, 1859, and the last of the first volume in July, 1860. The subscription price was two dollars and a half; it contained 680 pages.

May 1, 1861, Mr. Jones retired from the firm, the business being continued by Dr. Samuel S. White.

With the close of the sixth volume, Dr. J. D. White retired from the editorial staff. To overcome the inconvenience of the volume closing at the middle of the year, the ninth volume consisted of five numbers only, volume ten beginning with January, 1868.

With the close of volume thirteen, December, 1871, Drs. McQuillen and Ziegler severed their connection with the "Dental Cosmos," and Dr. James W. White, a brother of the publisher, assumed its editorial management.

Dr. Samuel S. White died December 30, 1879, the trustees of his estate then became the publishers of the ensuing volume, the twenty-second, 1880. Later they organized, in accordance with Dr. White's desire, The S. S. White Dental Manufacturing Company, which assumed and continued all his business interests, which included the publication of the "Cosmos."

May 27, 1891, Dr. James W. White, the editor of the "Cosmos," suddenly died. Since January, 1872, he had ably filled the position. He was well qualified by education and temperament to supervise a professional journal. He was in full accord with the purpose the first editors of the journal had in view, to treat dentistry as a science rather than as a vocation, and, while not neglecting the handicraft side of the calling, to educate its readers to appreciate the sciences on which its methods and practices are based, and those other sciences, a knowledge of which is indispensable to a dentist who desires

to associate with cultured professional gentlemen. It was this that Dr. McQuillen so persistently urged, and for this the "Dental Cosmos" has stood, from its first number to the present. While he was not alone in the editorship, his was a dominating influence, and it continued long enough to make an impress. The time came, however, when the welfare of the journal required that its official head should be less concerned in the turmoil of professional activities; it was then that Dr. James W. White took charge. While not of the profession he was well and favorably known to the profession at large. He was approachable, he had no professional hobbies, his insight was quick to distinguish the true from the false, the possible from the impossible or the probable. He was a scholar, and a master of the English language. Under him the "Dental Cosmos" became the leading dental journal of the world; it still holds a foremost place, with, however, several close contestants for the honor.

Dr. James W. White was succeeded by Dr. Edward C. Kirk, the present incumbent, who assumed the editorship in July, 1891. Under Dr. Kirk, the "Dental Cosmos" has continued its prosperous career.

The "Dental Cosmos" has been particularly fortunate in that its three principle editors have been so well qualified for the task of editing a dental journal, and that its publishers have so liberally contributed to make it what it is. It has now reached its fiftieth volume, each one as good, or better than the last.

JOHNSON AND LUND'S JOURNALS THE DENTAL QUARTERLY AND THE DENTAL OFFICE AND LABORATORY.

This enterprising firm began the publication of a dental journal in March, 1862, entitled "The Dental Quarterly," edited by the late Dr. Ambler Tees. The first number had twelve octavo pages of the firm's advertisements and four of reading matter. As time went on it was now and again enlarged, and while it contained many well written articles, its main purpose was to advertise the firm's business. Beginning with the second volume, Mr. F. N. Johnson assisted Dr. Tees in the editorial work. In the number for December, 1867, the last of the sixth volume, the publishers announced that it would be the last number of the journal in its present shape, and hereafter they would issue a monthly dental newspaper entitled "The Dental Office and Laboratory."

The first number appeared in March, 1868, four folio pages of advertisements and four of reading. The volume ended with February, 1869, and was succeeded by the second volume, which ended with December, 1869, so as to begin the next volume with the beginning of the year. George R. Welding was the managing editor. At the close of the fifth volume, December, 1872, it was discontinued.

April 1877, its publication was resumed as a folio quarterly of ten pages. The last number of the journal in this form, was the last of volume ten, December, 1886.

January, 1887, it appeared as a quarterly in octavo form, edited by the late Dr. Theodore F. Chupein, beginning the first volume of the third series. The fourth series began with the second number of the second volume, with no change, however, in the journal; the cover continued to be marked "third series" until November, 1889. The volumes are numbered consecutively from January, 1887. It became bimonthly with No. 1, of volume third, January, 1889, and so continues (1908).

Dr. Chupein died March 23, 1901, and was succeeded by Dr. J. Edward Line, of Rochester, N. Y., the present editor (1908). Under Dr. Chupein's administration the journal was greatly improved. He was a tireless worker, and in addition to being himself a writer of ability, had the happy faculty of appreciating and selecting items of practical interest to dental readers from the many journals, scientific and professional, he was accustomed to read; these were copied by other dental journals, and the "Dental Office and Laboratory" became the most frequently quoted dental journal published. Dr. Line has had many years experience as an editor of a dental journal; under his management the journal is holding the place in dental literature his predecessor made for it. The more than forty volumes of Johnson and Lund's little journal have been helpful to many, perhaps more so than some more pretentious publications.

THE DENTAL TIMES.

Early in 1863, the faculty of the Pennsylvania College of Dental Surgery, Philadelphia, deemed it desirable to have a means of communicating with the profession entirely within its own control. It was for this purpose that they edited and published the "Dental Times," a quarterly journal of dental science, octavo in form, containing in the beginning about forty pages in each issue. The first number is dated July, 1863. While its main

purpose was to advance the interests of the school, it soon became recognized as an acceptable professional journal. It was in no sense a student's journal. Its contributors were experienced writers, and its pages contain much of scientific value. On the completion of the tenth volume, April, 1873, the faculty decided it was no longer needed, and it was discontinued.

THE PENNSYLVANIA JOURNAL OF DENTAL SCIENCE.

Dr. Samuel Welchens, of Lancaster, Pa., impressed that much of value brought out in the local dental societies of the state in the way of essays and discussions was wasted for the want of a medium for publication, conceived the idea of a dental journal especially devoted to the interests of the professional associations within the state. Impressed that these would furnish enough material, and that those interested were able and willing to support the enterprise as editor and publisher he launched the "Pennsylvania Journal of Dental Science," an octavo monthly, in January, 1874. It was an ambitious effort for one man to publish a dental journal the peer in size and make up of any dental journal then published; the sequel proved, however, that the profession of a single state was not equal to the task of its maintenance. The first volume contained 514 pages, and was illustrated by fine engraved portraits of Drs. Chapin A. Harris, C. A. Kingsbury, of Philadelphia; John Allen, and Asa Hill, accompanied by biographical sketches of each.

The second volume contained portraits of Drs. Thomas W. Evans, L. P. Meredith, A. G. Cogswell, and Samuel Welchens. The enterprise failed to receive a remunerative support, and on the completion of volume third it was discontinued.

The third volume of this journal is of interest in that it contains a paper read before the American Academy of Dental Surgery, in New York, October 20, 1875, by Dr. John W. Riggs, entitled, "Suppurative Inflammation of the Gums, and Absorption of the Gums and Alveola Process." It is found in Volume III, March, 1876, page 99. This is the only communication from Dr. Riggs to the profession over his own signature describing the conditions for some time known as "Rigg's Disease."

THE DENTAL BRIEF.

A dental journal entitled "Welch's Monthly" appeared in August, 1896, edited by T. B. Welch, M. D., of Vineland, N. J., and published by A. S.

Robinson, of Philadelphia. Dr. Welch was the founder of "Items of Interest," and its editor until business reverses of its publishers caused it to pass into other hands. "Items of Interest" was an unpretentious little journal, it was well managed and edited, and had proved a decided success. Dr. Welch modeled his new journal on much the same lines as his old one. With the beginning of the second volume, August, 1897, the title was changed to the "Dental Brief," and its publication assumed by the L. D. Caulk Company, of Philadelphia, dealers in dentists' supplies. The third volume consisted of five numbers only, so as to begin the fourth volume with the beginning of the year. Dr. Welch was advanced in years, and other business interests were pressing, he, therefore, retired, and was succeeded, at the beginning of the fourth volume, by Dr. Wilbur F. Litch, its present editor. His management, and its publisher's liberality, have made it one of the leading dental journals; it is artistic in its "make-up," scholarly, and well filled with original articles by experienced writers.

ITEMS OF INTEREST.

Toward the close of 1877 the publication of various articles upon the use of amalgam for filling carious cavities in human teeth, by Dr. J. Foster Flagg, and others interested in the improvement of that material, incited a general interest in its betterment throughout the profession. Shortly after, while the subject was under discussion at a meeting of the New Jersey State Dental Society, Dr. Thomas B. Welch, a prominent member of the society, gave an interesting account of a series of experiments he had made looking to its improvement. The results were promising, and to encourage further effort a resolution was adopted asking him, or some other of the society's members, to perfect and put on the market a reliable alloy, and other reliable filling materials, selling the same at a reasonable price.

Encouraged by this, Dr. Welch continued his experiments, and later began the manufacture of alloy and other dental preparations which quickly received the endorsement of his fellow members as being superior to those heretofore in use. As a means of advertising his products, he began, in July, 1879, the publication of a bimonthly dental journal entitled "Items of Interest." He was then located at Vineland, N. J. Mr. S. F. Hamilton, of that town, was its publisher. It was in folio form, eleven by fourteen inches, each number having four pages. Dr. Welch was a ready writer; he had the happy faculty of quickly appreciating and tersely expressing the gist of cur-

rent literature, and of selecting items of real interest to his readers. These selected items and his advertisements made up the contents of his little journal. Because of its inconvenient form and being a mere advertising sheet, it received so little care that now but very few copies of its early issues are in existence. The subscription was fifteen cents a year. The second volume began with June, 1880, with S. C. Slade, of Vineland, publisher. It consisted of four numbers, so as to bring the beginning of the next volume to the first of the year.

The third volume began with January, 1881. The subscription was raised to twenty-five cents, and the number of pages increased to six. With the issue of the third number of the third volume it became a monthly, and was increased in size. Dr. Welch's business of manufacturing dental supplies having very much increased, he removed to Philadelphia, about August, 1881. The fourth volume was quarto in size. The first number of the fifth volume was also this size. After its publication, the doctor decided to change to octavo, and sent out a circular to his subscribers asking all who were preserving the journals to let him know, as he intended to republish the January number in octavo form for their benefit, which he did. This accounts for many files of the fifth volume with this number missing. While he had a large subscription list, a very large number were sent out each month gratuitously.

After several changes the publishing firm became the Wilmington Dental Manufacturing Company, Dr. Welch continuing as editor. In July, 1896, this firm became financially embarrassed, and the journal became the property of the Consolidated Dental Manufacturing Company, of New York, which continued its publication, appointing Dr. R. Ottolengui editor. The current volume was concluded on much the same lines as it began. With the first number of the next volume, the nineteenth, the page was enlarged, and its general makeup made more artistic and attractive. Under Dr. Ottolengui it has been very much increased in size and its contents more systematically arranged. It has commanded the attention of a larger number of experienced writers, and has reached a more influential position in the profession as the result of his aggressive and progressive editorship.

Dr. Thomas B. Welch was a unique character. He was keenly interested in phonetic and reformed spelling, advocating it in his journal, and for a time adopted it, much to the amusement of those who failed to appreciate its confusing simplicity. He hated profanity, ungentlemanly language, in-

temperance, and tobacco in all its forms, and constantly denounced them in "Items of Interest." He had but little patience with verbosity, and with telling force criticised the misuse and waste of words so frequently seen in poorly edited dental journals. He now and again selected examples of this, condensing a half page or more into a few crisp, well constructed, easily understood sentences. For a time he offered to "schoolmaster" matter written for dental journals, whether intended for his own journal or for others. His constant "hammering" at it undoubtedly brought about a marked improvement in the work of dental writers and careless editors. Dr. Welch served his day and generation thoroughly well, and his little journal proved helpful to thousands who especially needed just the matter he supplied. It has grown wonderfully under new management; it owes much, however, to its sponsor and founder, Thomas B. Welch, who made a place for it in dental literature.

THE NEW YORK DENTAL RECORDER.

The first number of this monthly dental journal is dated September, 1846. It was octavo in form, published and edited by J. S. Ware, M. D., dentist, No. 29 Bond street, New York; the subscription price was one dollar a year in advance. The first volume contained 142 pages. It was well edited, and had rather more of a scientific tone than any of his contemporaries. Many of the articles are of decided interest. An account of the early operations under ether anesthesia taken from a medical journal is of historic interest; as is also a full narration of the now forgotten case of Mr. N. P. Ames, which figured so prominently in the famous "amalgam war." His death was said to have resulted from mercury poisoning caused by the amalgam used in filling his teeth, and was loudly proclaimed by the anti-amalgamites as a warning against its use. The evidence here given proves conclusively that it had nothing to do with Mr. Ames' untimely death; his physician emphatically declares that "the idea was too ridiculous to be entertained for a moment." The strong language used pro and con indicates how hot the battle raged; while the story as here given shows conclusively that prejudice against the material was the ruling factor with its opponents. The closely printed pages of this little volume are of much interest from cover to cover.

The first number of the second volume is dated October 1, 1847. In the editorial column Dr. Ware announces his retirement from the journal, and in a kindly worded paragraph introduces his friend, Dr. C. C. Allen, as his successor, who makes his bow, and outlines the future of the "Dental

Recorder." With the advent of the new editor the "Recorder" loses much of its scientific tone, and is concerned more with the routine of dental practice. Its articles are varied, and it numbered among its contributors many whose names are closely associated with the best in the profession. It is interesting to look over its pages and note among much that is passed, much that is current more than half a century later, or has been but recently retired. In volume four, June, 1850, page 224, we find a lengthy article on "copper amalgam," giving instructions on its preparation, etc., that would have been read with interest some twenty years ago when that preparation was "all the go." In volume five, September, 1851, page 259, Dr. Asa Hill, then of Norwalk, Conn., has a long communication upon gutta-percha for tooth filling, which he introduced some three years before, and which has since become indispensable in dental practice.

Beginning with the sixth volume, Dr. Hill became coeditor of the "Recorder," and with the eighth volume its publisher and editor. We presume it was not a profitable venture; in nearly every number for some years prior to this change the editor has complained bitterly of an increasing delinquent list, some years not one-half of its subscribers having paid their subscription. This has been the universal experience of all who have attempted the publication of a professional journal as a separate and distinct business venture. It was the same with the "American Journal of Dental Science" and the "Dental Register," and the reason why so many promising dental journals so quickly reached their last number. In order to increase their circulation, copies were sent to all whose addresses were known; when these were not returned it was presumed by the publishers that a new subscriber had been obtained. On presentation of a bill some months later, an angry reply was quite as frequent as a bankable enclosure. Many had the ambition, talent, means, and opportunity to make a useful and creditable publication, but all lacked the requisites to find for it a profitable market, without which long continued success is an impossibility. This latter requires a business training, and a business connection seldom found outside of an established well ordered business. Thus it was that these early dental journals either died young, or were taken in charge as part of the machinery of a business establishment. The "Dental Recorder," before the close of its eighth volume, became the property of Sutton and Raynor, dental dealers, 609 Broadway, New York. Beginning with volume nine, Dr. Charles Wiley Ballard became the editor.

The following notice was published with the number for December, 1856:

To the Patrons of the Dental Recorder:

The tenth volume of this journal ends with the present number.

With an ample subscription list, we find our collections inadequate to paying the expenses of the magazine: we have, therefore, concluded for the future to avail ourselves more than heretofore of its value as an advertising medium, and to issue numbers only at such intervals as may suit our convenience.

SUTTON AND RAYNOR.

February 28, 1857.

This was the end of the New York Dental Recorder.

THE NEW YORK DENTAL JOURNAL.

The "New York Dental Journal" was a quarterly, octavo, edited by Frank H. Norton and George H. Perine, and published by George H. Perine, of New York City. The first number appeared in July 1858. This and the number for October, 1858, constituted the first volume. It seems to have ended its career at the sixth volume. The constant complaint on its pages of nonpaying subscribers indicates that it was not appreciated. There seems little reason why it should have been. It was poorly edited and contained but little of interest.

THE VULCANITE.

The "Vulcanite," a quarterly journal devoted to the science of mechanical dentistry, was edited by B. W. Franklin, and published by the American Hard Rubber Company, of New York City. The American Hard Rubber Company was the predecessor of the Goodyear Dental Vulcanite Company, whose representative, Josiah Bacon, caused the dental profession in the United States so much turmoil a few decades ago. Mr. Franklin was the Hard Rubber Company's agent for selling licenses to dentists, and supplying them with requisites for mounting teeth on the new base, and this journal was published to advance their and his interests. The subscription was fifty cents a year, but it was sent free to all who held a license. While its main purpose was to instruct and interest the profession in the use of the new base, it contained some articles not closely associated with this; some selected, and some original. The first number is dated May, 1860, the last of the first volume, February, 1861. The second volume began with May, 1861, and ended with February, 1862. The publication was then discontinued.

JOHNSTON'S DENTAL MISCELLANY.

This excellent dental journal, an octavo monthly, was published by Johnston Brothers, dental dealers of New York. The first number is dated January, 1874. No editor is named; it bears evidence, however, of careful and painstaking supervision. Throughout its career it was as it began, a clean, dignified, scientific, professional dental journal. In the fall of 1881, the firm of Johnston Brothers and The S. S. White Dental Manufacturing Company united and the firm of Johnston Brothers ceased to exist. In the last number of Volume VIII, December, 1881, the discontinuance of the "Miscellany" was announced, and the hope expressed by its former publishers that its contributors and subscribers would transfer their allegiance to the "Dental Cosmos."

THE INTERNATIONAL DENTAL JOURNAL.

This journal was the successor of a monthly dental journal published at Baltimore by B. M. Wilkerson, entitled the "Independent Practitioner," a monthly journal devoted to medical, surgical, obstetrical, dental and hygienical sciences, edited by Drs. Harvey L. Byrd and Basil M. Wilkerson. The first number is dated January, 1880.

"And Popular Sciences" was added to the title page of the second volume. Its scope proved too comprehensive. While the motive was good, the attempt to cater to two professions was not sufficiently appreciated by members of either to furnish it sufficient support. After several changes of owners and editors, it was taken in charge by an association of New York dentists formed for the purpose, the New York Dental Journal Association. Dr. W. C. Barrett, of Buffalo, N. Y., was appointed the editor, and it became a dental journal. Under his management it was fairly successful. This journal had no connection whatever with any commercial interests. It was published by dentists, for dentists.

Early in 1888 a movement was started which culminated in the organization of the International Dental Publication Company, organized for the purpose of taking charge of this journal, and of making it more useful to the profession. Sufficient stock was issued and subscribed to furnish a working capital, with the understanding that all profits were to go to the betterment of the journal. The name was changed to the "International Dental Journal." Dr. W. X. Sudduth replaced Dr. Barrett as editor, and also became the business manager. Dr. Sudduth, having accepted a position in the

University of Minnesota, resigned in July, 1890. Dr. James Truman, of Philadelphia, was then elected editor.

For some years the journal was quite successful. Its pages were filled with well written original matter, and it was accorded a prominent place among the dental journals of the day. Later, all the dental journals connected with dental supply houses reduced their subscription rate from two dollars and a half, to the nominal sum of one dollar; they were able to do this as they were largely used to carry the advertisements of the publishing firms. The International Dental Journal, having no other resources than its subscription list, was unable to meet this reduction. It was discontinued with the close of the twenty-sixth volume, December, 1905. Immediately thereafter the International Dental Publication Company wound up its affairs. All obligations were promptly met and it disbanded.

This was by far the most successful effort ever made in the United States to publish an independent dental journal. The journal itself, from start to finish, was a clean, well edited, professional journal. It was well supplied with original articles, and rigidly excluded from its pages all matters not pertaining to dentistry and its collateral sciences. It was well supported until the subscription of all dental journals was reduced to below the cost of manufacture. This competition the publishing company was unable to meet without abandoning the purpose for which it was formed.

THE DENTAL ADVERTISER.

Later

THE DENTAL PRACTITIONER AND ADVERTISER.

This quarterly journal, published by the Buffalo Dental Manufacturing Company as an advertising medium, was a long lived journal. It began in August, 1869, edited by Dr. Theodore G. Lewis. Dr. Lewis was well qualified for the task, and made good use of the little quarterly in presenting from time to time matters of interest to the profession. After twenty-two years' service as its editor, the pressure of other duties compelled him to resign it to other hands. The publishing firm selected as his successor Dr. William C. Barrett, who had made of the "Independent Practitioner" a distinguished success, a change in the ownership of that journal having relieved him of its care a few years before. It was decided to enlarge the journal, and to emphasize that enlarged, and with a new and experienced editor, it was entering upon a new career. It was rechristened "The Dental Practitioner

and Advertiser." Dr. Barrett entered upon the work with zeal and energy. He was a vigorous writer, and, with all, a thorough master of his native language. He wasted no words, and so placed them that there could be no mistake in the ideas they were intended to represent. He had a well matured and comprehensive grasp of professional affairs; he was positive, yet courteous; with unbounded confidence in his own convictions, he was scrupulously respectful in regarding the convictions of others. As a newspaper editor, and an editor of professional journals, he had been a watchful student. The first numbers of the journal under his management, and the position accorded it by the profession, gave evidence that a recognized master was in charge.

The first number of the rechristened journal, No. 1, of Volume XXIII, is dated January, 1892. Very few quarterly journals of its size, from 200 to 240, octavo pages a year), commanded the respect and exerted the influence that this one did. It is to be regretted that its career was so short. Business embarrassments of the publishing firm compelled its discontinuance on completing its twenty-ninth volume, October, 1898.

ODONTOGRAPHIC JOURNAL.

The first number of the "Odontographic Journal," a quarterly, was issued in April, 1880, edited by Dr. J. Edward Line, and published by Davis and Leyden, dental supply dealers, of Rochester, N. Y. It contained about sixteen pages of reading matter. In 1886, Mr. Leyden retired, and the business, including the publication of the journal, was continued by the Rochester Dental Manufacturing Company until it failed in 1897. In all, seventeen volumes were published, the last number dated January, 1897. Dr. Line was the editor from the first to the last volume. It was well filled with original and selected matter of interest to dentists. The later numbers contained from sixty to eighty pages.

THE DENTAL PRACTITIONER.

The "Dental Practitioner," an octavo monthly journal, published by Mr. Gideon Sibley, dental dealer of Philadelphia, and edited by Dr. Charles E. Pike, began in January, 1883. Beginning with the third volume, Dr. Pike was joined by Dr. L. Ashley Faught. On the completion of the fourth volume, December, 1886, it was discontinued. This journal, primarily in-

tended to advertise the publisher's business, was well edited, and contained a number of well written original articles. The subscription price was fifty cents a year. Each volume had from 200 to 300 pages.

THE PEOPLE'S DENTAL JOURNAL.

The "People's Dental Journal," as its title indicates, addressed itself to the laity, and was intended to instruct the public regarding dental matters. The object was commendable. Unlike many so called dental journals professing to be published with this object in view, it was what it professed to be. Dr. L. P. Haskell was its publisher, and Drs. Walter W. Allport and S. T. Creighton its editors. Its contents are well written, varied, and ethical. It was published at Chicago, the first number dated January, 1863, and the last October of the following year. Only two volumes were issued, each consisting of four quarterly numbers. It deserved a better fate than to die so soon. The subscription price was fifty cents a year.

THE DENTAL REGISTER,

Formerly

THE DENTAL REGISTER OF THE WEST.

The movement for the advancement of the dental profession and its organization at New York and Baltimore in 1839 and 1840, was quickly followed by the formation of dental associations in all parts of the country. As part of this, on August 13, 1844, a number of progressive dentists met in the lecture room of the Medical College of Ohio, at Cincinnati, and organized the Mississippi Valley Association of Dental Surgeons. This was the first dental association organized that did not make the suppression of quackery a cardinal point in its expressed objects. Mutual improvement in the science and practice of the profession; prompting gentlemanly courtesy; social and professional intercourse; frequent interchange of opinions and observations; and to elevate the standing of the profession and make it worthy of the confidence of an enlightened public, were the objects named in the call which brought these gentlemen together. The organization was long lived—it lived to celebrate its golden anniversary—and then disbanded. Changes incident to the rapid growth in population and industries of that section of the country made desirable a rearrangement of dental association business.

It was, in its early days, an active and progressive association and did much to build up the profession in the middle west. The lack of means for professional communications was soon felt; nearly all of the few dental journals were published in the eastern states. To meet this need the publication of a dental journal under the auspices of the association was broached and, meeting with favor, a committee was appointed to consider the cost, and the advisability of publishing a quarterly dental journal. At a meeting of the Association held at Cincinnati, September 8, 1847, this committee reported in favor of the project, and it was decided to publish a quarterly journal of at least forty-eight pages, the first issue to number 500 copies. But little time was lost. With the title, "Dental Register of the West," the first number appeared in October, 1847, Dr. James Taylor, of Cincinnati, assuming the work of editor and publisher, assisted by Dr. B. B. Brown, of St. Louis, Mo. The subscription price was fixed at two dollars per annum. The publication compared favorably with its compeers. When we remember that the labor of collecting matter for its pages, editing, and managing this enterprise was mainly the work of an already busy man, and moreover work in a new field, we can readily overlook errors due to inexperience.

The financial results of the first volume were not encouraging. Of its subscription list of eighty, seventy only had paid; its income from advertisers amounted to fifteen dollars. The total income for the first year amounted to one-hundred and fifty-five dollars. The association made good the deficiency, and the journal entered its second year. In the first number of the second volume, Dr. Jonathan Taft, makes, probably, his first appearance as a dental writer, in an article entitled "The Use of the Key." He was then located at Xenia, Ohio, and had just well started upon his long and useful career. The financial results of the second year were not equal to the first, poor as they were. The income was less, and the expenses greater.

Beginning with the third volume, October, 1851, the journal became the property of Dr. James Taylor, who continued as editor and publisher until the close of the ninth volume, when it was transferred to Drs. Taft and Watt. During this time it had been now and again enlarged, the ninth volume containing 448 pages; the subscription price, at the beginning of this volume, was advanced to three dollars per year. Dr. Taylor's large practice and his increasing duties as a dental teacher compelled him to relinquish his labor of love in publishing a needed and fairly successful dental journal. It had earned for itself a place among the journals of the day; it had proved a factor in building up the profession and helping it to keep pace with the

growing needs of the many prosperous communities rapidly filling up the middle west. More than this it had brought to the fore and introduced to the profession many who have since won distinction as dental writers, teachers, and investigators. To Dr. Taylor, it doubtless proved a financial burden, and the source of much anxiety and care, for it was to him it owed its life at the most critical period of its existence. That it has continued to prosper, has entered its sixty-second volume and is today the oldest dental journal in the world, is evidence that his nine years devotion to dental journalism were not spent in vain.

The first number issued by its new owners, No. 1, of Volume X, October, 1856, consisted of 152 pages, a considerable increase. A still further enlargement was promised as soon as the subscription list warranted the increased expense. The following number was issued in December instead of January, so as to make its issue intermediate with other quarterly dental journals and so furnish the profession with a succession of reading matter at shorter intervals. Volumes ten, eleven and twelve bear the imprint of Taft and Watt, editors and publishers.

Mr. John T. Toland, an enterprising business man who had established a dental depot at Cincinnati, began in April, 1858, the publication of a quarterly dental journal entitled the "Dental Reporter," as an aid in advertising his business. He made of it quite an interesting publication, at the very modest price of twenty-five cents a year. The two-hundred octavo pages which constituted the first volume were well filled with interesting and instructive articles. Early in 1859, he purchased the "Dental Register," and announced that fact in the fourth number of the "Reporter," stating that the "Reporter" would be discontinued, and that, with the beginning of the thirteenth volume of the "Register," July, 1859, it would be issued monthly, Drs. Taft and Watt remaining as editors. Up to this date the progress of the "Register" had been hampered for want of funds, a large number of its subscribers proving delinquent. Dr. Taft, referring to this when taking leave of the journal as its publisher, announced that Mr. Toland would enforce the rule of payment in advance strictly, and that in the future the rule would be "no pay, no journal." It is presumed that Mr. Toland managed the business end of the journal better than did its former publishers, as after he took charge much less complaint of unpaid subscriptions appeared on its pages.

The fourteenth volume was a short one, beginning with July, 1860, and ending with December the same year, so as to make the following volume

begin with January, 1861, and avoid the inconvenience of the volume ending in the middle of the year.

Mr. Toland's connection with the "Register" closed with the beginning of the civil war. He entered the army and lost his life in a battle at Wytheville W. Va., July 18, 1863. Dr. Taft again became its publisher, volume fifteen, 1861, bearing his imprint on the title page. He remained its publisher until the close of volume twenty-five, when Spencer and Moore, who in the meantime had succeeded to the business established by Mr. Toland, took it in charge. In 1874 the firm became Spencer and Crocker, and later Samuel A. Crocker and Company, by whom it is now published. On account of impaired health, Dr. Watt retired from the editorship in 1873. Early in 1900, Dr. Taft, after some forty-four consecutive years' connection with the journal, retired, and Dr. N. S. Hoff, of Ann Arbor, became the editor, a position he has filled acceptably to the present. While the "Dental Register" during its long career has not been as well edited as some other dental journals, nevertheless, as the professional journal of the west it has been well supported. Rivals have come and rivals have gone, while it has steadily held its pace. Under its present management, its "make up," and its matter are better than formerly.

The "Dental Register" and the "Dental News Letter" as continued by the "Dental Cosmos," have had the largest continuous existence of any dental journal of the world. The "Dental Register" and the "Dental News Letter," began on the same date, October, 1847, as quarterly dental journals. In July, 1859, the "Dental Register" became a monthly journal, and one month later, August, 1859, the "Dental News Letter" gave place to a new monthly journal, the "Dental Cosmos." This is a somewhat singular coincidence. Furthermore, they each have been the leading dental journals in the section of country in which they are located. Inasmuch, however, as the "Dental Cosmos" is the successor, and not a continuation of the "Dental News Letter," to the "Dental Register" belongs the honor of being the oldest dental journal in existence. The second on the list is the "British Journal of Dental Science," dating from July 1, 1856; the sturdier and more portly "Dental Cosmos" ranks third in age.

THE DENTAL REVIEW.

The "Dental Review" appeared as an independent monthly dental journal published by W. T. Keener, of Chicago, Ill., for the "Dental Review

Company," also of Chicago, in November, 1886. Beginning with the third volume it was published for the Review Company by H. D. Justi, of Philadelphia, a dealer in dental supplies. This arrangement continued until the close of the seventh volume; it then became the property of H. D. Justi and Son, and since January, 1904, it has been published by that firm as their journal.

Dr. A. W. Harlan, M. D., D. D. S., was the editor, assisted by J. W. Wasall, M. D., D. D. S., Louis Ottofy, M. D., D. D. S., J. G. Reid, D. D. S., and L. L. Davis, D. D. S., associate editors. Various changes have been made in the associate editorial staff from time to time. The eighth volume was edited by Dr. C. N. Johnson, Dr. Harlan having retired temporarily, to resume the position a year later. With the close of the fifteenth volume Dr. Harlan retired, and Dr. Johnson assumed the editorship. At this date, April, 1908, he still edits the journal, and the firm of Justi and Son are the owners and publishers. The publication is dated from their Chicago branch; the home of the firm is in Philadelphia.

The "Review" has been ably edited; its pages have been well filled with original matter strictly related to the science and practice of the profession, and nothing offensive to professional ethics or gentlemanly instincts has ever marred its pages.

THE MISSOURI DENTAL JOURNAL,
THE NEW ENGLAND JOURNAL OF DENTISTRY.
and
ARCHIVES OF DENTISTRY.

The Missouri Dental Journal" was for fifteen years a prominent western journal, and numbered among its contributors all the more talented members of the profession in the west. It published a large number of excellent articles, and from first to last was well conducted. It began in January, 1869, an octavo monthly, published at St. Louis, Mo. Homer Judd, M. D., D. D. S., as the editor in chief, took charge of the department of the journal embracing articles of a scientific or literary character; the department of operative dentistry was in charge of Dr. Henry S. Chase and that of mechanical dentistry in charge of Dr. W. Eames, assistant editors. Near the close of its career, Drs. C. W. Spalding and R. S. Pearson, had in turn its editorial management. The last nine months of its existence it was published in Kansas City. Financially it was not a success, and suspended in December, 1883. Shortly after this event a number of dentists associated

together to resuscitate the journal under the title of the "Archives of Dentistry," which was published simultaneously in St. Louis, Chicago, and Atlanta, with Dr. C. W. Spalding, editor. The first number, dated January, 1884, was not issued until March; the following numbers were issued more rapidly until the lost time was made up. The later part of the year, November, 1884, the "New England Journal of Dentistry" was consolidated with it. The "New England Journal," published at Springfield, Mass., by a company of dentists organized for the purpose, began in January, 1882, and was discontinued October, 1884, those interested in it joining in sustaining the "Archives"; Dr. C. S. Stockton, being added to the editorial staff, as the eastern representative of the journal. The "Archives" was an excellent journal. The financial problem, however, became pressing, and it ceased with the publication of the December number for 1890.

THE DENTAL SUMMARY,

Formerly

THE OHIO STATE JOURNAL OF DENTAL SCIENCE.

The "Ohio State Journal of Dental Science," published by Ransom and Randolph, dental dealers, of Toledo, Ohio, with Dr. George Watt, editor, began in January, 1881.

Dr. Watt was a well known, skilful, dental practitioner, a scientist, a ready and a witty writer, who had had many years editorial experience in editing the "Dental Register." Owing to ill health he had for several years led a retired life. With restored vitality his desire for work and his love for his profession asserted itself, and he again donned the editorial harness. Under his management the new journal became a decided success. While its circulation probably was not large, it, nevertheless, quickly secured a prominent place among dental periodicals as a useful and welcome monthly. Dr. Watt's telling witticisms were very much appreciated; there was a dignity and a purpose about them, and a directness that provoked a laugh and carried conviction far more quickly and far more pleasantly than would have done a long and able argument.

Beginning with the eighth volume, Dr. L. P. Bethel became associate editor. As the years passed Dr. Watt gradually failed, and died, February 16, 1893, aged seventy-three years. Dr. Bethel assumed the editorship, which he has acceptably held to the present.

On the night of January 4, 1902, the printing office in which the journal

was printed was destroyed by fire, and with it the January issue of the journal. This necessitated resetting the type. It was thought best by its owners to change the name of the journal to that which it now bears. Beginning with the twenty-second volume, January, 1902, it became "The Dental Summary." It is still published by the successors of the original firm, with Dr. L. P. Bethel, editor. January, 1908, it began its twenty-eighth volume.

THE DENTAL DIGEST.

The Dental Protective Association of the United States was organized under the leadership of Dr. J. N. Crouse, of Chicago, Ill., for the purpose of protecting the dental profession against the exactions of owners of patents of doubtful value or wholly illegal. In connection with it, he later organized a co-operative dental supply company. This journal came into existence as part of these enterprises, and was made their official organ. The first number was dated January, 1895. It soon became a recognized dental journal, making a specialty of publishing each month a summary of the more important papers published by other dental journals, foreign and domestic, hence its name, the "Dental Digest." In addition to this, it publishes original contributions, reports of professional societies, editorials on passing events, etc. Until his death, January 3, 1906, the editorial management was in charge of Mr. D. H. Crouse, son of Dr. Crouse, although his name does not always appear upon the title page. He made of it an acceptable and useful dental journal. Dr. J. P. Buckley has recently assumed the editorship; he brings to the journal matured experience as a dental practitioner and recognized ability as a writer upon professional topics, and will, no doubt, keep the "Dental Digest" well to the fore.

THE WESTERN DENTAL JOURNAL.

The "Western Dental Journal" is a prominent monthly, edited by Drs. F. O. Hetrick and J. P. Root, and published by Hettinger Brothers, of Kansas City, Mo. It is now in its twenty-second volume.

THE INDIANA DENTAL JOURNAL.

The "Indiana Dental Journal," edited by Dr. George E. Hunt, and published by the Indiana Dental Journal Company, of Indianapolis, Ind.,

a monthly, began in January, 1898. It was among the early journals to assume an artistic "make up." The editor tempered professional dignity with a little select humor, and made, what seemed to be, an acceptable dental journal. It did not prove remunerative, and on closing the third volume, in a quaintly worded editorial he announced its discontinuance, because "the editor was tired."

THE AMERICAN DENTAL JOURNAL.

This monthly dental journal, edited by Dr. G. W. Cook, and published by Frink and Young, of Chicago, Ill., is now in its seventh volume, and seems to have an assured place in dental literature.

THE DENTAL ERA.

The "Dental Era," published by H. D. Nolde, of St. Louis, Mo., and edited by Dr. Herman Prinz, has reached its seventh volume, and very well holds its own.

THE TRI-STATE DENTAL RECORD.

This quarterly journal is published by the O'Brien Worthen Company, of Keokuk, Iowa, and edited by Dr. J. W. Marsh.

THE JOURNAL.

This is a quarterly dental journal published by the New York Institute of Stomatology (a local dental society), the American Academy of Dental Science, the Harvard Odontological Society, the Metropolitan District of the Massachusetts Dental Society and the Boston and Tufts Dental Alumni Association, jointly, under the direction of a committee of publication, and is mainly taken up with their proceedings. It began in April, 1906. It has completed two volumes.

DENTAL JOURNALS OF THE SOUTHERN STATES AND THE PACIFIC COAST.

This portion of our country, being more sparsely settled, has not proved an encouraging field for dental journals. The first effort south of Baltimore was entitled the "Southern Dental Examiner." It was born at an unfortu-

nate time, May, 1860. Causes incident to the civil war ended its career after eighteen monthly numbers had been issued.

The "Dental Luminary," published by Drs. J. P. and W. R. Holmes, dental dealers of Macon, Ga., as an advertising medium, appeared in 1879 as a quarterly, and continued until May, 1893, when it was consolidated with the "Southern Dental Journal."

The "Southern Dental Journal" made its appearance in February, 1882, published by Dr. Robert A. Holliday, with Dr. B. H. Catching, of Atlanta, editor, as an octavo monthly of eighty-eight pages, half of which were reading matter. In February, 1890, Dr. Catching was succeeded by Dr. H. Herbert Johnson. In January, 1892, Dr. Robert A. Holliday became the editor. In May, 1893, it was united with the "Dental Luminary" under the title, "Southern Dental Journal and Luminary"; later it became a quarterly, and in 1900 it was discontinued.

"Catching's Compendium of Practical Dentistry," an interesting annual edited and published by Dr. B. H. Catching, was made up of gleanings from various dental journals and other sources. Practical hints, new methods and processes, items of information concerning the profession, etc., carefully selected, were in these yearly volumes systematically arranged for quick and ready reference. The idea was excellent. The first volume contained the gleanings for the year 1890. In all, seven volumes were published, the last dated 1897. The financial support it received was not sufficient to compensate the labor and expense involved in its production, and its publication was discontinued. The seven volumes are a monument to Dr. Catching's industry, his thorough familiarity with dental literature, his quick apprehension of practical matters, and his ability to logically arrange such matters for ready reference.

The "American Dental Weekly," the "Busy Dentist," the "Atlanta Dental Journal," the "Dental World," "Dental Hints," and "Plugger Points" were well meaning efforts in dental journalism that quickly reached the end of their financial resources.

(The author is indebted to Dr. H. H. Johnson, of Macon, Ga., for information concerning the southern dental journals.)

The first dental journal to appear on the Pacific coast was the "Dental Jaiurus," in January, 1880, published by W. O. Thraikill, a dental dealer of Sacramento, Cal., with a corps of editors scattered all over the country. The name was later changed to the "Pacific Coast Dental Journal."

In January, 1893, the "Pacific Coast Dentist" appeared. In June, 1895,

the journal changed hands and became the "Pacific Coast Dentist and Stomological Gazette." The former owner objecting to this, it was changed to the "Pacific Coast Stomological Gazette." Beginning with volume sixth, it was rechristened the "Pacific Medico-Dental Gazette," and later, January, 1900, "Medico," was omitted. It is still published as the "Pacific Dental Gazette." This repeated change of names is quite confusing. It is published at San Francisco, Cal., by the J. W. Edwards Dental Company, and edited by Dr. F. T. Platt.

The "Texas Dental Journal" is a small quarterly, dating from 1883. It is still published at Dallas, Texas, and is now in its twenty-fifth year.

The "Dental Headlight," another modest quarterly, published at Nashville, Tenn., is now in its twenty-ninth volume.

Dental journals now published in the United States not including college journals, and those published for advertising purposes only are:

M. American Dental Journal. Frink and Young, Chicago, Ill., publishers; Dr. G. W. Cook, editor.

M. American Journal of Dental Science. Dental Publishing Co., Madison, Wis., publishers; Dr. W. Gird Beecroft, editor.

M. The Dental Brief. L. D. Caulk Co., Philadelphia, Pa., publishers; Dr. Wilbur F. Litch, editor.

M. The Dental Digest. J. N. Crouse, Chicago, Ill., publisher; Dr. J. P. Buckley, editor.

M. The Dental Era. H. D. Nolde & Co., St. Louis, publishers; Dr. Herman Prinz, editor.

M. The Dental Register. S. A. Crocker & Co., Cincinnati, Ohio, publishers; N. S. Hoff, editor.

M. The Dental Review. H. D. Justi & Son, Chicago Ill., publishers; Dr. C. N. Johnson, editor.

M. Dental Summary. Ransom & Randolph, Toledo, Ohio, publishers; L. P. Bethel, editor.

M. The Dentists' Magazine. Cogswell Dental Supply Co., Cleveland, Ohio, publishers; Drs. Jackman, Wilson, Ebersole and Barne, editors.

M. Items of Interest. Consolidated Dental Manufacturing Co., New York, publishers; Dr. R. Ottolengui, editor.

M. Pacific Dental Gazette. J. W. Edwards Dental Co., San Francisco, Cal., publishers; Dr. F. L. Platt, editor.

M. Tri-State Dental Record. The O'Brien Worthen Co., Keokuk, Ia., publishers; Dr. J. W. Marsh, editor.

Q. Texas Dental Journal. A. C. Cary & Co., Dallas, Texas, publishers; Dr. J. G. Fife, editor.

M. Western Dental Journal. Hettinger Bros. Manf. Co., Kansas City, Mo., publishers; Drs. F. O. Hetrick and J. P. Root, editors.

Q. Dental Headlight. Morrison Bros., Nashville, Tenn., publishers; Dr. J. A. Dale, editor.

Bi-M. Dental Office and Laboratory. Johnson & Lund, Philadelphia, Pa., publishers; Dr. J. E. Line, editor.

M. The Dental Cosmos. S. S. White Dental Manf. Co., Philadelphia, Pa., publishers; Dr. E. C. Kirk, editor.

Q. The Journal, Published jointly by dental societies of New York and Boston.



Edward C. Mills

A Historical Review of Dental Literature

By Edward C. Mills, D. D. S., Columbus, Ohio

THE literature which represents any human interest is the measure of its importance. It is the proof of existing culture and of accumulated intellectual labor, broadening the human intellect and illuminating the paths to wisdom and understanding. The arts, sciences and professions have each their appropriate literature which keeps pace with their advancement, and upon which their growth and expansion depend.

Dentistry had not even a name of its own until literature began to develop for it a record of its deeds and possibilities, its methods and aims. We can hardly over-estimate its influence in our profession, and we owe to the painstaking and unselfish labor of our dental writers our honorable status among the learned professions. It is a far cry from the polished and learned treatises of today back to the earliest dental record extant.

The torch of enlightenment for succeeding civilizations was held in the hands of Egypt, and her time-worn monuments, standing in the dawn of the historic morning of the world, we know mark not the beginning, but mutely testify to former periods of growth in art and science.

To the great centers of learning, such as Heliopolis, Memphis and Thebes, were attracted the noted writers of antiquity, and to one of them, Herodotus, we owe much of our knowledge concerning the practice of medicine among the Egyptians, and he speaks of dentistry as of a well established fact. They were specialists, each physician treating only one certain portion of the body, or applying himself to one class of disease only—that they had treatises on the various specialties we are assured by the Ebers Papyrus—and doubtless, in

the ill fated Alexandrian Library of 700,000 volumes, we might have discovered the first contributions to dental literature.

Hippocrates, B. C. 460, the founder of Greek medicine, gives us in his medical writings, the earliest known literature pertaining to the teeth. Whether his precepts could be found useful today may be judged from his theory of the origin of the teeth: "There is a glutinous increment from the bones of the head and jaws of which the fatty part is dried by heat, and burnt up, and the teeth are made harder than the other bones because there is nothing cold in them."

Hippocrates gives a crude description of the diseases of the teeth, advises their removal when loose and decayed, recommends actual cautery, and mentions a mode of fixing them with wire when the jaw has been fractured. He was the inventor of probably the first dentifrice, made by pulverizing the incinerated remains of the head of a hare and three mice, with which was mixed equal parts of powdered marble.

Aristotle, pupil of Plato and tutor of Alexander the Great, has left on record his belief that the male sex possess more teeth than the female; that all mammals have teeth, but not always in both jaws; that the teeth continue to grow during life, but that the bones have a fixed limit to their growth.

Eristratus speaks of the lead forceps in the temple of Apollo, at Delphi, and Herophilus relates several cases where extraction of a tooth proved fatal.

The writers just quoted lived during the period of Greek history when sculptural art reached its zenith, a state of perfection since unequalled. But their worship of the outward beauty of the body was accompanied by the strongest prejudice against its mutilation, even for so laudable a purpose as the study of its structure. Hence, the fanciful ideas regarding many of the organs which continued unchanged until a later period, when the Greek physicians at Alexandria, under the influence of Egyptian practices of embalming, promoted their knowledge of anatomy.

Celsus, in his "De Medicina," gives directions for extracting, and instructions relative to some dental operations.

Areteaus, an able Greek medical writer of Cappadocia, asserts the cause of toothache to be known only to God.

Pliny (b. 23 A. D.) distinguishes the indestructibility of the teeth as compared to bone.

Galen (b. 130 A.D.) studied with the most eminent medical teachers of Smyrna, Corinth and Alexandria, during which time he was a laborious dissector of animals, and attained a high degree of medical and anatomical

knowledge. His writings remained the common source of anatomical lore for fourteen centuries, and the influence of his teaching gave way only before the new era of anatomy founded by Vesalius. Galen gave the best account of the teeth that had yet appeared—taught that they are formed during gestation. The canine tooth is called the eye tooth because it receives branches from the nerve which distributes other branches to the eye. He describes forms and functions of the teeth, and attributes to them the sense of feeling.

Civilization owes a large debt to the Saracens. Realizing the value of the treasures of antiquity, they translated them into Arabic—the scientific works of Aristotle, the treatise on medicine by Galen, the astronomical writings of the Alexandrian Greeks—thus forming the source of the flood of learning which later was to be poured into Europe through the channels of the Crusades and the Arabian schools of Spain.

The celebrated Aetius of the Arabians, during the sixth century, states that the teeth are open at the roots, and supplied from the tri-facial nerve. He recommends stopping them with wax and galbanum when decayed, and adds that they grow until old age. Furthermore, he was the first to advocate the use of the file in dental operations.

Albucasis, an Arabian physician of the eleventh century, is the first to recommend replacing the teeth, when lost, by other human teeth, or substitutes made of bone, and also gives descriptions of operations upon the teeth.

When the great Roman Empire fell, it buried beneath its ruins the noble Latin tongue, and when it struggled to the light again, after the lapse of centuries, it had suffered many changes by contact with the dialect of the Teutonic conquerers, and, instead of a universal language, intelligible to all, it was supplanted by the Romance languages. These were the medium of daily colloquial intercourse; but all learning and knowledge, all history and science, lay buried in a dead language, and the wisdom of the ancients, inscribed on manuscript rolls, was carefully preserved in the monasteries. Scholasticism arose with its School-men in whose keeping was placed the knowledge then extant.

In the fourteenth and fifteenth centuries the returning light of intelligence came with the Renaissance, a revival of classical learning and art. Monasteries and cathedrals were searched for manuscripts, libraries were founded where they could be studied, and thus the wisdom of Greece and Rome became the eternal heritage of mankind. Immediately following the Renaissance, southern Germany produced the power which was to revolutionize the intellectual world, the art of printing, which, in the estimate of Hallam, is the most important discovery in the annals of mankind. This wonderful method of disseminating

knowledge spurred the wits of the world, and civilization proceeded by leaps and bounds, aided by her handmaids, art, literature and science.

In 1543, at Basil, a treatise was published "*De Corporis Humani Fabrica*," by Vesalius, the first comprehensive and systematic description of the human body. Breaking down the traditions of some fourteen centuries, it formed the foundation of the modern science of anatomy. Vesalius obtained his knowledge from facts revealed by his scalpel on the human body. His teachings were so fiercely opposed by the physicians of the Galenean schools that, rather than admit the fallibility of Galen, they declared the human body had undergone changes since the time of their long revered master. Vesalius, in his observations on the teeth, considered the temporary teeth as the germs of the permanent.

During the year 1541, the first separate publication on the teeth appeared, a quarto volume "*Zahnarzney*," at Frankfort, by Chr. Engenolff, a translation of which appears in the "*Dental Cosmos*" of January, 1887.

Literature, arts and the sciences thrive when there is quiet confidence in the government, and freedom from foreign influence. During the last half of the sixteenth, and the first quarter of the seventeenth centuries, France was engaged in the Huguenot wars, Spain was occupied in her vain endeavor to suppress the revolt of the Netherlands, while Germany, the country which had seen the birth of the Reformation under Luther, and had been distracted for more than a generation, was restored to quiet with the Peace of Augsburg. Externally she was at peace, and save the internal hostilities occasioned by the irreconcilable character of creeds, was enjoying a period of tranquility. During this period no less than fourteen contributions were made to dental literature, showing that the teeth had commanded the attention of the Teutonic mind. Among them are Ryff's treatise on the eyes and teeth, published at Wuerzburg in 1548; another, "*Zahnarzney*," by Bodenstein, at Frankfort, in 1576; Monavius, "*De Dentium Affectibus*" at Basil, in 1578; Heurnius, "*Eyes, Ears and Teeth*," at Leyden, 1602; and "*Zahnarzney-Buechlein*," an anonymous pamphlet, compiled from the works of Galen and others, in 1614, the earliest known edition of which under the title of "*Artzney Buchlein*," was published 1532. Considering the large place occupied by "*das Essen*," it is perhaps only natural that Germany should take an early interest in striving to preserve the teeth.

In Spain, De Castrillo brought out an octavo volume, "*De Dentitione*," in 1557, at Valladolid, followed by a second edition at Madrid, in 1570; Martinez, a treatise at Valladolid, in 1557; while in Italy, Eustachius pub-

Artzney Buch
lein/wider allerlei kran-
ckeyten vnd gebrechen der zehen/gezogen
aufs dem Galeno/Avicenna/Mesue/
Cornelio Celso vnd andern mehr
der Artzney Doctorn /seher
nützlich zu
lesen.
M. D. XXX.



TITLE PAGE OF THE OLDEST DENTAL PUBLICATION KNOWN.

Editions of this work are known of dates 1532, 1536, 1541, 1559, the last, so far known,
 is dated 1614.

COLOQVIO BREVE Y
cōpédioso. Sobre la materia d̃ la dé
tadura, y marauillosa obra d̃ la bo
ca. Cō muchos remedios y au
fos neccessarios. Y la ordē
de curar, y adreçar
los drentes.



¶ Dirigido, al muy alto y muy pode
roso señor: el Principe dō Carlos nro se
ñor. Cōpuesto por el Bachiller Fracisco
Martinez. Natural dela villa de Castrillo
de onielo. Estäte en Valladolid. 1557.

Con preuilegio.

¶ Esta tassado en L VII. mrs.

TITLE PAGE OF THE OLDEST SPANISH DENTAL WORK.

BARTHOLOMAEI
EUSTACHII
SANCTOSEVERINATIS
LIBELLVS DE
DENTIBVS.



Cum priuilegijs.

VENETIIS,
M D LXIII.

TITLE PAGE OF THE FIRST WORK ON DENTAL HISTOLOGY.

lished at Venice "*Libellus De Dentibus*" in 1563, and at Ferrara, Lanzoni published "*De Saliva Humani*," in 1602.

The treatise of Eustachius, a tract of ninety-five pages, was probably the most valuable contribution of the sixteenth century. He gives a description of the two sets of teeth, corrects the error of supposing the temporary teeth were germs of the permanent, inquires into their structure, and considers their hardness proportionate to the ferocity of the animal; concerning their development, he describes the follicles, vessels and nerves, and observes that they are nourished differently from bones, because, among other reasons, their fractures cannot be made to unite. He relates a series of anomalies in the development, and speaks of a case of four successive dentitions.

Ambroise Paré (1517-1590), who introduced the ligature for arteries after amputation, in 1536, laid the foundation of modern surgery. In his medical works, which were very much in advance of his times, he enters somewhat into detail regarding the teeth, and states that the adherence to the socket is due to a ligament, that they continue to grow throughout life, and, with the tongue, distinguish taste. He used the cautery for curing toothache, and recommends oil of vitriol for the same purpose. He was the first to describe the operation of transplanting, and reports a case where it was successful. He advocates the use of the pelican in extraction, and gives details of the operation. In substituting teeth for those that have been lost, he recommends ligating them with gold or silver wire, or by thread of silk or flax.

Urban Hemard, of France, published an essay on the "*Art of the Dentist*," at Lyons, in 1582, this being the first separate publication on the subject in the French language.

The incessant disturbances during the seventeenth century, which made Europe one great battlefield, gave a tremendous impetus to the advance in anatomical and surgical knowledge. Surgeons and physicians hastened to put into print the results of their experience, and the discoveries made in treating the wounded; and scarcely any work of importance failed to give due prominence to the teeth, though little was written that differentiated the dentist from the surgeon.

Leeuwenhoek (1632-1723), Dutch anatomist and microscopist, in 1678 discovered the tubular structure of the teeth, having with glasses observed that the whole tooth is made up of very small straight and transparent tubes.

Malpighi (1628-1694), Italian anatomist, recognized the difference between tooth structure and bone in 1687, mentioning the enamel fibers and tubular structure of the dentin.

Highmore, in 1651, immortalized his name by describing the maxillary sinus. Wharton published, in 1669, his observations on the glands, and Steno, at Leyden in 1680, gave to the world the results of his investigations relative to the glands and ducts of the mouth, eyes and nose.

At the dawn of the eighteenth century, unhappy France was torn and ravaged by foreign and civil wars provoked by the ambition and greed of Louis XIV; but her men of science led the world, and dentistry had its share in the advance, and began to be recognized by medical literature as a separate profession. The intricate anatomy of the mouth and jaws had been sufficiently analyzed and described for practical purposes, and the ground work prepared upon which the future system of dental surgery was to be erected. The patient researches of individual workers resulted in the accumulation of much material, and awaited the coming of one of those master spirits whose advent seems a response to the beckoning of science, that his magic hand, with intuitive skill, may so array her truths as to afford the ordinary mind material for deduction during the ages that succeed him.

Such a character appeared in the person of Pierre Fauchard. He was born in the days of "Le Grand Monarque," and the work he bequeathed to posterity stands forth in the history of dental literature as prominently as does the gorgeous splendor of the court of Louis XIV in the history of the political world. It was written when France was swiftly descending toward the abyss of the Revolution, and the foreshadowing of further discoveries in dental surgery bespoke for him a far more lasting monument than the records of monstrous egotism and selfishness left by his king.

When Fauchard located in Paris, in 1719, he found a spirit of jealousy and little disposition to share knowledge. Realizing the necessity of a broader education, he laments the fact that provisions are not made by authorities to bring about this end. No better illustration of his broadness of mind can be given than the statement in making known a certain improvement: "To the prejudice of my own interests, I now give the most exact description of this invention." It is impossible, within the limits of this article, to enter into detail the contents of his work, but a hasty examination must suffice. The first edition of his work, "*Le Chirurgien-dentiste*," was published in Paris, in 1728, in two duodecimo volumes, making 919 pages, with forty-three page illustrations. A second edition appeared in 1746, and a German translation in 1733. Although many appliances described seem crude, others have continued in use to the present day. He describes the structure, position and connection of teeth, sets aside the old theories of dental worms, and gives as the

Opera Chirurgica
**AMBROSII PA-
 RAEI, GALLIARVM RE-
 GIS PRIMARII, ET PA-
 RISIENSIS CHIRVRGI**

Quibus continentur,

*Non solum perfectissima curandi ratio tumores, praeter naturam, ulcera, ulcera, luxationes,
 & fracturas:*

Verum etiam humani corporis, singulariumque partium, exactissima anatome:

*Curatio item oculorum aliorumque afflictorum quae Chirurgi exposcit manum, & ab alijs ba-
 licum desuper non sunt:*

*Insuper physio logica multa, & therapeutica, lectu dignissima: cum Philosophia, tum Medicis op-
 erum vtilia & necessaria.*

**A DOCTO VIRO, PLERISQUE LOCIS RE-
 cognita: & latinitate donata.**

**IACOBI GILLENKAMP, REGII ET PARISIENSIS CHI-
 rurgi laudis & diligentia.**

**OMNIA NUNC DENUM MAGNO STUDIO ELIMATA: ET
 auctis: consilio eleganti summi illustrata.**

Cum Gratia & Privilegio Caesar. Maiest.



FRANCOFVRTI AD MOENVM, APVD

Ioannem Feyrabend, Impensis Petri Fischert.

M. D. XCIII.

cause of caries, the formation of a humor in the osseous fibers of the teeth, producing a pathological change, which destroys them. The external causes are—blows, use of the file, acids, alteration of saliva, impressions of heat and cold, and certain kinds of nourishment. Regarding treatment, he says, superficial caries should be removed by filing; deep cavities filled with lead, tin or gold, giving preference to tin, on account of better adaption to the walls of the cavity.

A device for excavating cavities by means of a revolving tool, is the germ of our dental engine. Fauchard modified the pelican for extracting, and illustrates several forms of forceps. He speaks of replanting and transplanting teeth, and believes there is a complete restoration of circulation and vitality. In correcting irregularities he seldom had recourse to extraction. He urges the necessity of attention to the temporary teeth, and in middle life used the forceps to correct mal-position, believing this practice to be original with him. He introduced the expansion arch in 1726, which, with some modifications, was used by Fox in 1803, Schange in 1841, Harris in 1850, and is widely employed by orthodontists of today.

Whether the work of Fauchard was instrumental in removing the barriers of individual isolation among practitioners, or the stimulus to awaken latent conceptions, there followed, a few years after its appearance, such a flood of dental literature as the profession had not previously witnessed. Men seemed to be possessed of a *cacoethes scribendi*, vying as to who could produce the most material for publication. Winslow, of Paris, in 1732 speaks of the fibers of the enamel; Bertin, in his treatise on osteology, gives a complete description of the teeth, and speaks of the pulp as a soft substance formed by a thickening of lymphatic juice; while Herisant gives his views on the formation of the enamel and organization of the gums—anatomists were contributing to the histology of the dental tissues, while the profession was striving to discover how to preserve them.

From 1728 until the appearance of the first edition of John Hunter's "Natural History of Human Teeth," in 1771, France contributed thirty-eight, Germany and Holland sixty-eight, Spain two, and England twelve, works on dental and kindred subjects. Many of these publications are merely treatises on toothache; some of them interesting and very valuable as contributions to our literature. Among them are—Girauldy's "Art of Preserving the Teeth," published at Paris in 1737; Lavini's treatise on the "Quality of the Teeth," with a method of maintenance and preservation, published at Florence in 1740; Bunon, 1741, 1743, 1746, results of his experiments and practice in Paris

hospitals. Bunon's work, published in 1746, contains the first dental pharmacopœia. Excepting an anonymous publication, "Curious Observations On That Part Of Chirurgery Relating To the Teeth," published at London in 1687, the work of Joseph Hurlock, "A Practical Treatise Upon Dentition, or the Breeding Of Teeth In Children," in which he discusses the serious influence of seasons upon dentition, published in London, in 1742, is the first contribution from England to dental literature.

At Paris, in 1746, Mouton published a monograph, "A Dissertation Upon Artificial Teeth," where gold crowns are first mentioned for the arrest of the ultimate destruction of teeth. To imitate the natural ones in the front part of the mouth, the crowns were enameled. He introduced the clasp for retaining artificial teeth, thus supplanting the ligature.

Lecluse, in his writings, published at Paris in 1750-1754-1755, describes a variety of dental instruments, among them the elevator which bears his name. He also describes the germ of every tooth as enclosed in an extremely vascular membrane.

In 1756, Philip Pfaff, dentist to Frederick the Great, published at Berlin a treatise on "Odontology," when for the first time mention is made of wax impressions and plaster models.

Bourdet, in 1757, published at Paris, "Researches and Observations, upon all Divisions of Dentistry," in a work of two volumes. Some of Jourdain's contributions to our literature also appeared about this time.

The year 1768 marks the appearance of the first important English publication, "A Treatise on the Disorders and Deformities of the Teeth and Gums," by Thomas Berdmore, surgeon-dentist to his majesty, followed by editions in 1769 and 1770. As this author is said to have been the preceptor of Robert Wooffendale, the first practicing dentist in America, his work deserves more than a passing mention.

He observes, in his preface, "that no instructions are to be derived from previous writers in his country on the subject, and he had endeavored to collect from predecessors in business, and from practice, whatever he thought conducive to its advancement." His work is divided into three parts: (1) A description of the teeth, in which he designates the neck of a tooth as the "collar;" all posterior to the cuspids are called molars; the fifth molars he calls the wisdom or "wise" teeth; (2) Diseases of teeth and contiguous parts; (3) Means that prevent disorders of the teeth.

He condemns the practice of burning the ear with a hot iron, the virtues of the loadstone, and certain charms and incantations as cures for toothache.

ESSAY
D'ODONTOTECHNIE,
O U
DISSERTATION
SUR
LES DENTS ARTIFICIELLES.

Où l'on démontre que leur usage n'est ni moins
commode, ni moins étendu, que celui des Dents
naturelles.

Par M. MOUTON, Chirurgien-Dentiste.



A PARIS,
Chez ANTOINE BOUDET, rue S. Jacques.

M. DCC. XLVI.

Avec Approbation & Privilège du Roi.

TITLE PAGE OF THE FIRST WORK ON PROSTHETIC DENTISTRY (1746).

Gold shell crowns, first suggested by Mouton, 1746, pages 137-139 of his work.

He differentiates between toothache and antral troubles and recommends extraction of a tooth, and piercing through the bottom of the socket to get access to the antrum. Rapid decay is designated "wet," and slow or yellow "dry" caries. He recommends, above other methods, a hot iron for destroying nerves, gives suggestions on the use and abuse of filing the teeth, and recommends replanting teeth that have been "beat" out and securing them with ligatures for some weeks.

Ruspini published a treatise on the teeth at London, in 1768, attributing caries to "external influences acting upon the compressed vessels of the teeth."

Curtis, in 1769, and Timaes, the same year, are the last English contributors to our literature before the advent of Hunter, who, in 1771, laid the foundation of the English system of dental practice.

The year Fauchard gave his great work to the world was marked by an event of great importance to surgery and dentistry, namely, the birth of the illustrious John Hunter, at Long Calderwood, Scotland, who, under the preceptorship of his brother, Dr. William Hunter, became the foremost anatomist and surgeon of the eighteenth century. Science seemed to be the chief end of his life. His extraordinary mind is shown in his works, and his lasting achievements stand as monuments to his remarkable energy and genius. An accumulation of facts and observations on the teeth and associate parts, founded on experiments familiar to all dental readers, published in 1771, in his work, "The Natural History of the Human Teeth," laid the foundation of dental surgery on a basis of physiological and pathological inquiry. To do full justice to his book, the first scientific work on the subject, it is only fair to remember the comparatively foggy and inexact state of knowledge prior to its production. His anatomical descriptions will ever hold a first place in our literature, and while his "Practical Treatise On Diseases and Curative Treatment of Teeth," published in 1778, did not meet the full approbation of many of his immediate successors, his views on that portion of his subject were founded on the knowledge of dental practitioners, whose practical experience he relied on as being greater than his own.

Subsequent investigations have added little to many subjects on which he has touched, and the imprint he has made on dental literature is evidenced by the frequency with which he is quoted by subsequent writers. It is hardly too strong a comparison to class him in this respect to Pythagoras, whose students and followers clinched their arguments by declaring "*ipse dixit*."

The environment of the period in which Hunter lived was a great stimulus to mental activity; for an age which produced such men as Samuel Johnson,

Burke, Gibbon, Goldsmith and Garrick, could hardly fail to inspire a man of his calibre. Among the last works of Sir Joshua Reynolds was a portrait of Hunter.

Following the work of Hunter, we witness the same effusion of dental literature as followed Fauchard. Ruspini's "Treatise On the Teeth," first published in 1768, had reached its eighth edition in 1797. Bennet's "Dissertation on Teeth," appeared in 1779, Jullion wrote in 1781, and R. Wooffendale's "Practical Observations on the Human Teeth" appeared in 1783. It is an average work of the period, of interest to American dentists as the author was perhaps the first dentist in the United States, practicing in New York and Philadelphia from 1766 to 1768, when he returned to England, remaining there until 1785, when he came back to America, where he died in 1828, being succeeded by his son John.

Robert Blake's essay on the "Structure and Formation of the Teeth," which was delivered as a thesis at the University of Edinburgh, in 1795, was published in Latin in 1798, and translated into English in 1801. It is considered the best physiological treatise on the teeth which had appeared up to that time.

Germany contributed a large number of works between 1771 and the close of the eighteenth century, and many of the leading French and English treatises had been translated into German. Plenck, in 1778-9, published at Wien, a treatise on "Diseases of the Teeth and Gums."

In France, during this period, Jourdain published at Paris, in 1788, his "Treatise on the Diseases and Surgical Operations of the Mouth and Associate Parts," in two volumes, with a set of well executed plates; while Betot published "Methods of Preserving the Teeth," in 1786, and "The Surgeon-Dentist," in 1789. About this time the efforts of French scientists, who were making extensive experiments in ceramics for the purpose of discovering a durable, life-like substance for the manufacture of artificial teeth, were crowned with success; and, in 1797, De Chemant published a monograph, both in French and English, describing the merits of a mineral paste which would take the place of the clumsy bone and ivory articles formerly used. His work, at the end, has reports and approbations of committees appointed by the Faculty of Medicine of Paris, the Royal Academy of Science, and of many physicians and surgeons of England, among them Dr. E. Jenner.

The first important work of the nineteenth century was Joseph Fox's "Natural History of the Human Teeth," published in 1803. A volume on the "Diseases of the Teeth," was published in 1806, and in 1814, a second edition

of these two works was published in one volume under the title of "Natural History and Diseases of the Human Teeth." Fox was a skillful practitioner, and among the first to devote his attention exclusively to dentistry. He was at one time a lecturer in Guy's Hospital, and his work was considered for a long period the best practical book on the subject in the English language. He gives an accurate description of the development of the teeth, and is at variance with his great predecessor, Hunter, on the vascularity of the teeth and the origin and pathology of decay. He makes some valuable observations on the diseases of the teeth and modes of practice. Part I of his work is a "History of Formation and Structure of the Teeth," with thirteen plates; while Part II is a "History and Treatment of Diseases of Teeth, Gums and Alveolar Process," to which is added ten plates.

Following Fox, we have Fuller (1810), Murphy (1811), Downing (1815), Hertz (1815), L. S. Parmly (1818) —an American practicing in London—and Bew (1819). These writers held such extraordinary and widely differing views as to the cause of caries that it is worth while to quote them.

Fuller considers it to be an original mischief, implanted during the formation of the teeth.

Murphy calls attention to the fact that no medicine has yet been discovered that will prevent or cure caries, nor is the cause producing it positively ascertained. Antral suppuration he attributes to worms, accounted for by supposing the ova of an insect have been deposited in the nostril, or drawn into the nose and passing into the antrum.

Hertz observed that animals living chiefly on hot foods are most subject to caries, and that increased circulation in the gums, whether due to salivation or inflammatory fever, frequently produces decay.

Parmly, in 1820, was the first to attribute caries to the action of external corrosive agents, such as fermentation of particles of food. Bew, after commenting on the hardness and flinty character of the enamel, inconsistently advances the idea that the destruction is due to lateral pressure.

Gerbeau, on "The Teeth" (1823); Snell, on "The Use and Construction of Artificial Palates" (1824); Sigmond, a "Practical and Domestic Treatise" (1825); and Andrew Clark, a "Practical Treatise for Preserving and Supplying Loss of Teeth," with a notice of an artificial palate of his own invention (1825), complete the list of English writers during this period.

To the French writers during the first quarter of the nineteenth century, we owe more for the scientific progress of dentistry, and toward the close of the period the field of literature assumes a broader expanse.

Laforgue, in 1802, published "The Art of the Dentist." Duval, from 1805 to 1820, wrote many useful and interesting works on a variety of dental topics. Gariot, in 1805, published his treatise on the "Diseases of the Mouth and Operations Appertaining to the Dental Art." Baumes, in 1806, published his treatise on "First Dentition," an essay which won a prize bestowed by the Paris Royal Society of Medicine. Serres in 1817, published an essay including a theory of dentition, treating of the development of the teeth at an earlier foetal stage than former anatomists. Regnart, in 1818, claims amalgam as his invention in a monograph describing a new method of filling. Delabarre published in 1819, a treatise on "Second Dentition," and, in 1820, a treatise in the "Mechanical Art of the Surgeon-Dentist." Bichat, the physiologist, (1771-1802), gives some valuable observations on the sympathies and functions of the teeth, in his "General Anatomy."

Audibran, in 1821, published a treatise on "Artificial Teeth." Joseph Lemaire, who introduced the French methods of dentistry in the American colonies during the revolutionary period, after his return to France contributed several important additions to our literature, notably a treatise on the "Physiology, Pathology and Treatment of the Teeth," a work of three volumes published in 1822-1824.

Baron Cuvier (1769-1830) was the founder of comparative anatomy. He considered the organs of mastication the surest indication to use in establishing the order, and even genus, to which an animal belongs. And thus our literature was enriched by researches in this new field of investigation, and works treating of comparative dental anatomy were soon added to the literature of our profession.

F. Cuvier, brother and scholar of the great Cuvier, published at Paris, in 1825, his work on the teeth of mammalia considered as zoological characters. Two years later, Rosseau followed with his "Comparative Anatomy of the Dental System in Man and the Principal Animals."

Each of the foregoing contains treatises on the development and structure of the teeth. Among the writers of this time was Oudet who gave much attention to the persistent growth of the incisor teeth of the rabbit. In 1823 he published "Proofs of the Continued Increase of the Jaws and Teeth of Rabbits," considered in their connection with their application to the study of the organization of the human teeth.

Germany, during the meanwhile, produced quite a number of works, among the most noteworthy of which are Hirsch's "Practical Observations on the Teeth and Their Diseases," published at Jena, 1801, and Serre's "Prac-

tical Treatise on Dentistry," published at Berlin in 1803. That the Teutonic race was keeping in touch with dental progress is evinced by the number of German translations made from the French writers of the period.

During the first years of the independence of the United States many were the taunts her citizens had to bear for the barrenness of her literary harvests. The conditions surrounding our early history were assuredly anything but conducive to the growth of literature in any field. Take the colonial period, with its few scattered villages strung along a thousand miles of seacoast, their inhabitants struggling against savages, pestilence and poverty; the revolutionary period, with its seven years of warfare; the early national period, with its stupendous problems of government and finance to be solved; where could a man be spared to write? The final goad, necessity, did not urge, for books were sent from the mother country. We can refer without shame to our unproductiveness in the field of literature, for now our writers are in the front ranks, and Sydney Smith's question, "Who reads an American book?" is answered in chorus, "The whole round world, and the inhabitants thereof."

Dental literature naturally kept pace with the other scientific literatures at this time in America. During the colonial period, dentistry, as such, was practically unknown. During the revolution the few books on that subject reached us from foreign shores; and when we consider the really able and versatile practitioners who lived during the early years of our national independence, it seems most remarkable that so few contributions were made to dental literature. But the seed sown by the pioneer English and French dentists had taken root, and during this apparently latent period, was making a healthy and steady growth, which, before the end of the first half of the nineteenth century, was to bear as its fruit the three great factors in the development of dental education: the Dental Journal, in 1839; the Dental Association, in 1840, and the Dental College, the same year.

A great number of the early publications, both American and foreign, were small popular works, which generally added more to the reputation of the author than to the available literature of the profession, but they drew the attention of the public to the value and importance of the teeth, and in this way did much good. The first American production was a treatise on the human teeth by R. C. Skinner, of New York, in 1801. This was followed by a treatise on dentistry by B. T. Longbotham, of Baltimore, in 1802, in which root filling is first recommended. Among the contributions during the first quarter of the century, were popular treatises of L. S. Parmly, in 1816 and 1820, and during the latter year lectures on the care, treatment and natural

history of the teeth. Owing to the nature of his contributions he has been appropriately termed "the first apostle of dental hygiene."

Eleazer Parmly wrote a popular treatise in 1822, and a similar work, "The Family Dentist," by J. F. Flagg, appeared in the same year.

A treatise of 124 pages on "The Structure, Diseases and Management of the Teeth," by E. Gidney, of Utica, N. Y., published in 1824, is the most complete work up to this time. An interesting pamphlet on "Preserving the Teeth," by N. Peabody, of Salem, Mass., completes the list for this period.

When Europe was so completely under the domination of Napoleon, that it lay in his power to make and unmake kings, to distribute thrones and kingdoms, the French language predominated on the continent; hence the number of dental publications appearing in that tongue during the early portion of the nineteenth century. Following the Congress of Vienna, in 1815, a new life was instilled into scientific work, notably in Germany; and during the second quarter of the century, our literature was enriched by contributions from Germany and Sweden.

Raschkow, in 1835, published his work concerning the development of the teeth of mammals. Retzius, of Stockholm, published in 1837 a series of microscopic investigations, showing that beyond the external form of a tooth the members of the animal kingdom are characterized by a minute internal organization, before unknown. This work was brought to attention by a translation by Nasmyth, in 1839. Among others of the period are: Carabelli (1831-1844), "Systematic Text on Dental Science," in two volumes; Linderer (1837), "Text on Dentistry," including anatomy, physiology and materia medica; Adleman (1844), "Diseases of Antrum;" Czermak (1850), treatise on "Microscopical Anatomy of Human Teeth;" Perkinje (Bohemian, 1787-1869), whose studies of the structure of the teeth were published by M. Frankel in 1825 and Muller (1828), "The First Dentition."

In England, during the second quarter of the nineteenth century many works were added to our literature. So authoritative, and so frequently quoted are they, that they have made a lasting imprint on the trend of dental thought.

Leonard Koecker, in 1826, published his "Principles of Dental Surgery," a volume of great merit, and quoted by authorities of today; "Essay on Diseases of the Jaws," in 1828, followed by an edition in 1847; and an essay on "Artificial Teeth, Obturators and Palate," with twenty-one plates in 1835. Snell, on the "Construction of Artificial Palate," in 1824, excited a new interest in that branch of dentistry. In 1829, Thomas Bell's "Anatomy, Physiology and Diseases of the Teeth," appeared. He was Joseph Fox's successor

as lecturer at Guy's Hospital, and this work was produced to supply a desideratum in medical literature, the aim of the author being to embody all facts known at this time. Part I treats of the anatomy and physiology, while the second part is devoted to the diseases of the teeth and antrum. The popularity of the work is attested by the two English and three American editions it passed through during the eight years following its first publication.

The researches of Goodsir on the teeth, appeared in 1834. A practical treatise on the human teeth by William Robertson, published in 1839, shared a like popularity, two English and one American editions having appeared by 1841.

The contributions of Edwin Saunders, on the "Care of the Teeth," and "The Teeth Proposed as a Test of the Ages of Children," belong to this period. The professional life of this writer, through a long series of years, is marked for his untiring efforts in the elevation of his profession. For thirty-seven years he was dentist to her majesty, Queen Victoria, who, in 1883, conferred upon him the honor of knighthood in recognition of his labors, and the professional status dentistry had obtained. This was the first instance of knighthood conferred upon a dental practitioner on the ground of his practice as a dental surgeon.

Waite published in London, in 1835, a work on "The Gums, Their Structure, Growth, Connection, Diseases and Sympathies," the best contribution on the subject that had appeared.

Murphy in "A Popular Treatise on the Structure, Diseases and Treatment of the Human Teeth," published in London in 1837, describes his method of making and setting an inlay (page 200).

The publications of Alexander Nasmyth, "Researches on the Development and Structure of the Teeth," appeared from 1839 to 1849. To him we are indebted for the first demonstration of the membrane which has since borne his name.

Richard Owen's "Odontography" (1840-1845), is in two volumes, the first treating of the physiological relations, development and microscopic structure of teeth in vertebrates, the second containing 168 plates.

Among the long list of writers associated with this period, are: Clark (1829), Scott (1831), Nicholles (1833), Ashburner (1834), Jobson, (1834), Wardroper (1838), Mortimer (1845) and Robinson (1846).

Professional *esprit de corps* at that time was not sufficiently strong to prevent unfavorable comment on modes of practice as is shown in a popular treatise, "Every Man His Own Dentist," by Joseph Scott of London, pub-

lished in 1838. The author introduces a siliceous pearl for making artificial teeth, and severely criticises a contemporary who used ivory teeth, for remarking, "the method of making composition teeth is so simple that to describe it may occasion some risk of making the bakers turn dentists, and so deprive us of our daily bread, or at least render them as common as hot muffins."

The lectures of John Tomes, on "Dental Physiology and Surgery," delivered at the Middlesex School, and published in 1848, was the last important contribution to our literature during the period.

In France, meanwhile were published a great number of works on dental and kindred subjects. Among them are: Maury's "Dental Art," in two volumes, in 1833; Blandin's "Anatomy of the Dental System, Human and Comparative" in 1836; Flouren's *Researches on the Development of the Teeth and Bones*, in 1841; and the "Complete Elements of Dentistry," by Desirabode in 1843. William Rogers, probably an Englishman, practicing in Paris, published an "Encyclopedia of Dentistry," in 1845 and in 1846 the first "Dental Dictionary" was published by the same author.

Meanwhile, America had not been idle in her contributions to dental literature. James Gardette, one of the first and most illustrious names in American dentistry, published in 1827, "Observations on Transplanting Teeth." The following year, Samuel S. Fitch published a work "Remarks on the Importance of the Teeth," on their diseases, mode of cure, etc. To this author we are indebted for the first systematic treatise published in America, intended as a text for those adopting dentistry as a profession. It appeared in 1829, under the title, "A System of Dental Surgery," in three parts: 1—Dental Surgery as a Science; 2—Operative Dental Surgery, 3—Pharmacy connected with Dental Surgery.

The author states that the work is a compilation of every thing of value which had been written upon dental surgery, having availed himself of the labors of the most distinguished dental writers of England, France and other countries. A second edition followed in 1835. A physiological inquiry into the structure, organization and nourishment of the teeth by J. Trenor, of New York, appeared in 1828.

Following several popular treatises, "Dentalogia" appeared in 1833, a didactic poem on the diseases of the teeth and their treatment, by Solyman Brown. It was written as a testimonial of the sincerity with which the author reciprocated the sentiments and friendship of his distinguished contemporary, Eleazer Parmly. It consists of five cantos: 1—Invocation to Beauty; 2—

Dentition; 3—Apostrophe to Luxury; 4—Remedies for Dental Disorders; and, 5—Apostrophe to Health. In 1838, his muse inspired him once more to sing the praise of his beloved science in another poem, *Dental Hygeia*, in three cantos.

Following the popular treatises of Chewning (1833), Pleasants (1833), Smith (1833), Bostwick (1835) and Plough (1836), Spooner's "Guide to Sound Teeth" appeared in 1836. While a popular treatise it takes up the subject in detail, quoting the views of the best authorities on dental surgery. In this work the first mention is made of arsenious acid for devitalizing the dental pulp, and (page 122) mention is made of the Crawcours (probably a corruption of the French *craqueurs*, noisy boasting fellow, braggart), and their "royal mineral succedanium," which material later precipitated the "amalgam war," resulting in the dissolution of the American Society of Dental Surgeons in 1856.

Every profession has its members distinguished for their genius, talent and energy, and no member of our profession possessed these qualities to a more marked degree than Chapin A. Harris. This distinguished author, who was one of the most vigorous and productive of our professional writers, has properly been regarded as the founder of dental literature in America. His first contribution was published in Baltimore, in 1839, "The Dental Art," a practical treatise on dental surgery; the second edition appeared under the title of the "Principles and Practice of Dental Surgery," by which name it passed through the thirteenth edition in 1896. This work since its first edition appeared has maintained its position as a text for students in all parts of the world and the efficient manner in which it has kept abreast with dental progress is due to the careful and systematic editing of Professor F. J. S. Gorgas.

The essays on the utility of artificial teeth, and on first dentition, appeared in 1841 and in 1842 respectively. The "Natural History and Diseases of the Human Teeth," by Fox, being practically beyond the reach of the profession in America, he published an edition of this work in 1846, bringing it up to the improvements that had been made in dental surgery, and in 1849, there appeared a "Dictionary of Dental Surgery, Biography, Bibliography and Medical Terminology," 779 pages, the first dental dictionary published in the English language, the sixth edition of which appeared in 1898.

The publication of the "*American Journal of Dental Science*," in 1839, marks a new era in dental literature. The slow and laboring progress that had been made by the profession is attributable to the conservatism and zealous manner in which methods of practice were concealed.

The death knell to this selfish individualism was sounded in the appearance of dental journalism, and following the initiative taken by some of the broad, liberal minded and intelligent members of the profession, contributions began to find their way to the press. Thus it was, that the knowledge issuing from the rills of individual experience began to swell the streams of dental intelligence, which uniting, form that broad sea of information which holds in its bosom those facts and theories, which, undergoing a process of analysis and synthesis, later appear in the standard publications of our literature.

The "Library of Dental Science" was a portion of this pioneer journal devoted to the republication of standard works not easily attainable, some of which were out of print. In this manner were brought to the notice of the profession, through the medium of periodical literature, the works of Hunter, Brown, Baumes, Koecker, Gariot, Berdmore, Waite, Desirabode, Blake, Duval, Jobson, Lefoulon, Blandin, Delabarre, Jourdain and Bond.

In 1840 the American Society of Dental Surgeons began to publish in separate form essays on various dental subjects by the following members: Harris, Cuyler, Elisha Baker, Noyes, Brown, Foster, Maynard, L. S. Parmly, Townsend and Hayden. In 1844, Paul B. Goddard's "Anatomy, Physiology and Pathology of Human Teeth," made its appearance. The practical part of this work is due to the labors and experience of Joseph E. Parker. Popular treatises by E. G. Kelly, of Boston (1843); Robert Arthur, of Philadelphia (1845); a practical treatise by S. C. Herbert, of Philadelphia (1847); Burdell of New York, the same year; William T. G. Morton, of Boston (1847), on the "Administration of Sulphuric Ether;" and a popular treatise by Mayo G. Smith, of Boston (1848) conclude the list of best known writers of this period.

The period of 1850 to 1875 is conspicuous for the valuable contributions to dental literature, as the result of laborious and scientific research which had been carried on for many years. The new fields, in which different men had been working in an independent manner, brought forth an enormous amount of knowledge, which was contributed through the medium of dental journalism and the general treatises on dentistry. So much had been added to the various branches of the subject, that the works covering the entire field of dental knowledge began to be supplanted by treatises on the separate branches of the profession. The possibilities of the dental art began to unfold, and its literature had reached that period in its history when its writers began to specialize.

England, during this period, produced a great number of works, treating a variety of dental subjects. The celebrated work of John Tomes, "A System

of Dental Surgery," appeared in 1859, and a second edition was published in 1873. This is a work brought forth from the chaotic mass of material that had accumulated, and it embodies the product of the author's sound original investigations. It was left for him to demonstrate the true nature of the contents of the tubular structure of the dentin; and by a statement of facts, he fixes the function of the dentinal fibers as one of sensation, and the channel of nutrition to the dentin.

Owens' work on the "Skeleton and the Teeth," published in 1860; Richardson's "Medical History and Treatment of Teeth," also in 1860; Smith's "Handbook of Dental Anatomy and Surgery," in 1864; Hulme's "Dental Pathology," the same year. Cole's "Deformities of the Mouth," in 1870, and his "Dental Mechanics" in 1873, and Salter's "Dental Pathology and Surgery," in 1874, are the most familiar works of the period. Canton (1851), Fowell (1853), Howard (1853), Jones (1853), Parker (1857), Lukyn (1859), Makins (1861), Clendon (1862), Eskill (1867) and Shaw (1868) also contributed works of much interest and of varying importance during this period.

In the environment of scientific Germany during this period, our literature was being enriched by the careful investigation of Czermak (1850), Siebold (1854), Kolliker (1854), Waldëyer (1864), Hertz (1866), Boll (1868), Hoppe (1870), Muhldreiter (1870), Hertwig (1874), Frey (1874), and others in the field of dental microscopical and anatomical research; Giebel (1853), "Odontography;" Bruck (1861), "Operative Dentistry;" Carl Wedl (1870), "Pathology of the Teeth;" Leber and Rottenstein (1867), "Dental Caries and its Cause"—this latter was translated and passed through French, English and American editions.

France was not inactive during this period. Her foremost writers contributed chiefly works in the field of pathology. Giraldes, in 1850 and 1860, produced his works on the "Diseases of the Maxillary Sinus;" Talma, at Brussels, in 1852, "Notes on some Fundamental Points of Dentistry;" Oudet, in 1854, "An introduction to the Study of Anatomy and Physiology of the Teeth;" Forget, in 1859, "Dental Anomalies and Their Influence Upon the Production of Diseases of the Maxillary Bones;" Oudet's "Anatomical, Physiological and Microscopical Researches on the Teeth and their Diseases," 1862.

No writer of any previous or subsequent period has made as many varied and valuable contributions to dental literature as E. Magitot (1833-1897). His first contribution appeared in 1857, a treatise on structure and development of the teeth. The books, essays, and pamphlets from his pen from 1857 to 1897 number no less than sixty-five. His work on "Dental Caries," based

upon a long line of experimental and therapeutical investigations, was published in 1871; an American edition, translated by T. H. Chandler, appeared in 1878.

The "Origin and Formation of the Dental Follicle," by Legros and Magitot (1873), appeared in translation by M. S. Dean in 1880. Broca's (1867), "Treatise on Odontomes," and Maurel's "Contributions on Dental Pathology" (1873) are among the foremost works of this period. The practical utility and manipulative ingenuity which characterizes American dentistry, became a distinguishing feature of its literature during this period. Bond's "Dental Medicine" appeared in 1851, and reached the third edition, in 1863; Horner's work on "Extraction" appeared in 1851. Robert Arthur, of Baltimore, whose previous contributions to dental literature were of high merit, communicated to the profession his important discovery that gold could be made cohesive by heating, in a treatise on the use of adhesive gold foil, in 1857. Piggott's "Chemistry and Metallurgy as Applied to Dentistry" appeared in 1854. The "Operative Dentistry" that heralds the name of Taft in every quarter of the globe where dentistry is known, was published in 1859, passing through its fourth edition in 1882. Richardson's "Mechanical Dentistry," probably the most practical treatise that had up to this time been written, appeared in 1860. Garretson's "Oral Surgery," the first edition published in 1869, and the sixth in 1895 and the "Register Papers" a collection of chemical essays in reference to dental surgery, by George Watt, are representative of the work America was engaged in during this time.

Dentistry has developed to a degree commensurate with diligent research and persistent investigation, and each epoch is well defined in its literature. The great inventions and discoveries that have marked human progress during the last half of the nineteenth and the dawn of the twentieth century, have been so utilized in the principles of dental theory and practice that methods, which a few years since would have been considered the effusions of a perturbed mind, are being brought to practical perfection.

It is doubtful if any science excepting surgery has taken such rapid strides, and were it not for the new editions of our standard works they would soon be considered deficient in those essentials which constitute them authoritative. But what other impulse could contribute such an inspiring spirit to our dental writers? The sun is now fully above the horizon, and every country that has felt the influence of our literature has caught its beams. We are in the golden age of our literary history and every phase of dentistry is receiving due attention from our writers.

During the last quarter of the nineteenth and the early years of the present century, England, Germany, France and America have been most active in the practical and scientific phases of the work to which our professional standing is due and to the writers of these countries we are mainly indebted for the productions that have enriched our literature. England has added Sewell's "Dental Anatomy" (1876) "Dental Caries," by the same author (1884); Hunter's and Balkwell's works on "Mechanical Dentistry" in 1878 and 1880 respectively; Stocken's "Materia Medica" (1878); works on "Dental Surgery," Underwood (1880), Coleman (1881), and Barrett (1885); Tomes' "Dental Anatomy" (1882); Cole's "Dental Mechanics" (1876) and "Deformities of the Mouth," by the same author (1881); and Quinby's "Notes on Dental Practice" (1884).

Since 1885, new editions of many of the standard English dental works have appeared. In addition, the several departments of dentistry have received attention as follows:

Operative Dentistry—Quinby, Grayston and Underwood.

Prosthetic Dentistry—Pearsall, Rose and Hunter.

Orthodontia—Colyer and Wallace.

Oral Surgery—Glassington and Roughton.

Histology and Microscopy—Mummery, Williams, Goadby and Hopewell Smith.

Dental Anatomy—Tomes, Constant, Underwood, Widdowson and Gabell.

Pathology—Sewell, Smale, Roughton, Pedley, Milles, Underwood, Colyer, Turner, Fitzgerald, Nash and H. Smith.

Materia Medica, Chemistry and Metallurgy—Smith, Griffith, Fletcher and Glassington.

France, during the early portion of this period, produced a great number of works, covering a wide range of dental and kindred subjects. Maurel's "Contributions on Dental Pathology" and "Injuries of the Teeth" appeared in 1873 and 1875 respectively; Cruet's "Compendium of Dental Operations," in 1883. Many valuable contributions have been added by J. B. Abadie, E. Andrieu, d'Argent, H. Arnal, A. Brasusen, A. H. J. Briton, G. Bugnot, J. Camoin, F. Castinel, Chabaud, Chandler, E. Chapel, Chappuis, J. Choquet, Gust. Colle, Ant. Combe, F. Comby, Cornudet, d'Cournelles, F. Courtaix, Eug. Courtaix, A. Dam, Th. David, J. Delecluze, Albert Delucq, Paul Dubois, A. Eternod, Eyssautier, J. Ferrier, L. Frey, Gallas, Ed. Girard, Godon, Lambert, E. Lancereaux, Legros, Lemerle, Magitot, Claude Martin, P. Martinier, J. Maudet, J. A. Miller, Moure, L. Nux, P. Nuyts, Alb. Oveze, P. Papin, Papot,

D. Pinel, Gee, Pitsch, Rene Potelet, Pottier, A. Preterre, Quinecrot, Em. Raynaud, Redier, F. Regnault, H. Rodier, E. Sauvez, B. Seigneur, Serval, A. Tagac, Vignal, and C. Ziem.

In the meantime the most noteworthy contributions from Germany have come from the pens of Arkovy, Baume, Detzner, Felix, Gagenbauer, Hollaender, Kolliker, W. D. Miller, Neuman, Pfaff, Pietz, Preiswick, Rose, Scheff, Sternfield, Walkhoff, Wedl, Weil and Witzel.

America, during the early portion of this period, was active in producing new editions of standard works. The progress of American dentistry was an incentive to the publication of the first separate work devoted to its history, viz.: "The History of Dental and Oral Science in America," by J. E. Dexter (1876), prepared under the direction of the American Academy of Dental Science. Kingsley's "Oral Deformities," published in 1880, may be considered the pioneer work in the field of orthodontia. "Plastics and Plastic Filling," by J. F. Flagg, appeared in 1882. The first edition of Essig's "Dental Metallurgy" was published in 1882. "Notes on Operative Dentistry," by the peerless Marshall H. Webb, appeared the year of his death, 1883; and Gorgas' "Dental Medicine," the first edition of which appeared in 1884, has linked the name of this prolific writer with the pharmacopœia of the profession.

The exigencies of space forbid the mention of all the numerous works America has produced during the last two decades, which testify to those improvements which have so closely associated America with practical dentistry, and demonstrate that scientific investigations are not neglected in our country.

The various branches have received attention as follows:

Operative Dentistry—Fillebrown, Ottolengui, Weeks, Kirk, Johnson, Sayre, Marshall and Black.

Prosthetic Dentistry—Richardson, Evans, Haskell, Essig, Warren, and Goslee.

Orthodontia—Talbot, Guilford, Farrar, Angle, McDowell, Jackson and Case.

Oral Surgery—Garretson, Marshall, McCurdy and Grant.

Histology and Microscopy—Black, Broomell and W. D. Miller (of Germany by adoption).

Dental Anatomy—Black, Broomell, Bodeker, Cryer, Thompson and Eckley.

Pathology—Ingersoll, Blodgett, Bodecker, Warren, Inglis, Burchard, Barrett, Black, W. D. Miller and McWhinney.

Materia Medica and Therapeutics—Gorgas, Eames, Clifford and Long.

Chemistry and Metallurgy—Mitchell, Essig, Cassidy, Hodgen, Koenig and Hall.

Miscellaneous—Flagg, Ottofy, Black, Talbot, Taft, Gorgas, Guilford, Warren, Cigrand, Reh fuss, Catching, Steele, North, Ambler, Johnson, Custer and Prinz.

That the field of dentistry is too vast, and the various branches pertaining to it are too complex, for one individual to be considered *facile princeps* in all its departments, is evidenced by those works of composite authorship which have been added to our literature. The different subjects have been treated by specialists of recognized authority, and by the systematic editing of a master hand these contributions have been woven into texts which shall ever maintain their position as landmarks in our professional advancement.

The "American System of Dentistry," edited by Wilbur F. Litch, in 1886; the "American Text-book of Prosthetic Dentistry," edited by Charles J. Essig, in 1896, the third edition of which, by Charles R. Turner, appeared in 1907; and the "American Text-book of Operative Dentistry," edited by Edward C. Kirk, in 1897, the third edition of which appeared in 1905, are works typical of this class.

The advance of dentistry from a state of empiricism to one of scientific art can be chronologically traced in its literature; and while the luster of many of our brilliant writers has shaded into insignificance the efforts of many contemporaries, due recognition must be given the lesser lights for kindling that ardent desire for improvement which has been an inspiration for higher professional attainment.

Only a few writers have received the individual mention which many well deserve. The lives of many furnish examples of devotion to the profession that are well worthy of imitation; a few may have lived in affluence—many lived and died in poverty—but in their brief transit through time into eternity, for their efforts to perfect a science to avert and annul human suffering, they well deserve the encomium, *Amicus humani generis*.

From the standpoint of the modern critic, dentistry, like all other sciences, may be said to possess a superabundance of heterogeneous materials in its literature; but as heaps of chaff on the threshing-floor contain the golden grains of wheat, so within our great mass of literature are hidden the valuable gems and germinating thoughts developed into the perfected theories of modern writers.

Oral Surgery

By C. R. E. Koch, D. D. S., with the assistance of Truman
W. Brophy, M. D., D. D. S.

WHILE surgical operations of various kinds upon the tissues adjacent to the teeth in the territory of the oral cavity have been performed from time immemorial by dental and general surgeons, Oral Surgery under this distinctive appellation is of recent origin.

In 1870 the University of Pennsylvania established a lectureship on Oral and Associate Surgery, and assigned to the position of lecturer, Dr. James E. Garretson. This appears to be—as far as dental literature reveals—the first recognition of oral surgery as distinguished from general surgery. The announcement of this fact in the “Cosmos” of that year was contained in an editorial notice written by Dr. J. W. White, in which he said: “We especially congratulate medical students on the manifest advantages the establishment of such a clinic must afford, as the lack of thorough acquaintance on the part of the general practitioner and surgeon with the pathology and therapeutics of the mouth and topographically associated parts has been too often made apparent.”

Dr. Garretson's clinics were held every Wednesday, and during the summer months were free to all respectable students and practitioners.

An editorial in the “Cosmos” for 1873, on page (558), entitled “What is Oral Surgery,” replies to this inquiry made by a medical journal.

“An Oral surgeon is one who, having received a general medical and surgical education, is drawn by interest or inclination to the special duty and treatment of all abnormal conditions of the mouth, as are others to certain lines of practice now long enough established to have recognition as specialties. Just where such special practice shall begin, what it shall include, and where

it will find its limitations, will depend, as in the practice of every other specialty, on the inclination and capabilities of the practitioner.

"If, as suggested by the London 'Lancet,' it finds its boundary in 'stopping and extracting teeth,'—limited to a routine of mere mechanical manipulation,—the attempt to appropriate on such a basis of work or merit the honors of a learned profession is simply to court ridicule; while, on the other hand, to attempt to be an oral surgeon without the foundation of a medical education is neither more nor less than quackery. The 'Lancet,' familiar apparently with only that class of dentists who are known among us as 'tooth carpenters,' is astonished when a dentist aspires to do anything higher than 'to stop and to extract teeth.' Query. Is London dentistry not yet beyond the days of Paré? But, though unknown to the 'Lancet' there are in England, as well as in this country, those in the dental profession not unknown to fame—men who have earned, by study and practice, the title of oral surgeon; whose experience and proficiency in the treatment—medical, surgical, artistic and mechanical—of all lesions of the oral cavity entitle them to a name indicative of special knowledge and skill equally with those to whom are freely accorded the titles of aural or ophthalmic surgeons. * * *

"If the student of today is willing that his professional sphere shall find its limitations inside the lines which bounded our predecessors, he has not comprehended the meaning of the doctorate which is the object of his ambition. The standard is being steadily elevated, whether the profession is or not, and the man who is under measure must give way.

"It must not be inferred that the change prophesied is to be expected this week or next, nor without discouragements and opposition,—such is common history; but that dentistry, or oral surgery, as we prefer to call it, is to be universally recognized as a specialty of medicine, and its capable practitioners as worthy of the highest honors, we are quite confident, notwithstanding the query, 'What is meant by this new specialty?'"

An editorial in the same journal on page (640) is devoted to a reply to a criticism contained in the "Philadelphia Medical Times," in which that paper, as one of its objections to oral surgery, uses this language: "There is a further argument against oral surgery as a specialty, because 'it has no natural boundaries to limit it;' for, 'This very day, chancing to be at the clinic' of the lecturer upon oral surgery at the University of Pennsylvania we saw present three cases, two of which were tumors on the head. What does this prove, except the advantage of such a general medical education as will qualify for the practice of any branch? One who makes oral surgery a specialty, need not,

if he elect otherwise, decline the treatment of any case. The argument is only an endorsement of the higher education and wider culture for which we contend."

To this the "Cosmos" editor replies: "But let us reverse the picture. 'Chancing, this very day,' to step in at the house of a medical friend, a general practitioner, we found his wife suffering from an atrocious alveolar abscess, of the pathology and therapeutics of which the doctor was as innocent as a child, and had not recognized the imminent risk of an external disfiguring scar or fistula. This is not an extreme or isolated case. Doctors are proverbially ignorant of the proper treatment of the simplest dental lesions, and we doubt if one in ten can tell the period and order of eruption of the deciduous teeth, or explain the relation of the first molar to the temporary and permanent dentitions. If it be replied that such knowledge would not be demanded of the general physician, a fitting answer would be the fable of the dog in the manger. That doctors, as a class, are not familiar with dental lesions will not be disputed, and the effort to belittle the practice of those to whom they themselves apply when suffering in their own persons from such conditions, is, to say the least, in bad taste."

The editorial continues further: "The question is not what dentistry has been, but what oral surgery should be; not what are the qualifications of the majority of those now practicing it, but what is its legitimate province, and what the requirements for its intelligent practice. We see no force in the assumption that because the great bulk of the profession have hitherto spent their lives in a monotonous round of purely mechanical labor, therefore they must continue to do so in the future. We claim that the circle of physiological and pathological sympathies existing between the mouth and every portion of the economy demand first a general medical education, and then special training, that the highest results in treatment may be secured."

The "Medical Times" did not see fit to make a reply to this editorial at the time, but in 1875 this journal published a reply which appeared on page (323) of the "Cosmos" of that year in which the "Times" quoted Dr. James Truman as having said that there were from eight to eleven thousand persons engaged in the practice of dentistry, who did not possess the degree of D. D. S., whose general intelligence there was no means of knowing, and whose attainments probably did not go beyond the capacity for mechanical operations, and a large number of whom were not even experts in these; and in which Dr. Truman further took the position that dentistry then had no claim to be considered a specialty of medicine. The medical journal assured Dr. Truman

that while the dental profession might be divided on that point, that the medical profession was a unit in agreeing to this proposition.

The "Medical Times" further quoted Dr. Garretson as saying that he was "most decidedly in favor of the abolishment of the degree of D. D. S. One degree in medicine is enough; the greater covers the lesser, and includes it. A doctor in medicine possesses a title quite extensive enough in its signification to embrace any specialty that he may elect to practice; besides it affords the only possible bond of brotherhood with the members of the profession at large. We may be specialists, but we can never be esteemed as doctors, in the desirable fullness of the term, until we replace the D. D. S. with the M. D."

The article in the "Medical Times" continues: "Those gentlemen who look upon dentistry as belonging to medicine should weigh well the words of Dr. Garretson. On behalf of the medical profession, we freely admit that many, it may be all, of the dentists who took part in the debate, far exceed, in point of general, literary, scientific, and even in special medical culture, many of our physicians. But that does not affect the question. The medical profession is perfectly willing to admit dentists to its fraternity as soon as they become doctors of medicine, but never whilst they are merely doctors of dentistry. Really, the physicians are, in great part, indifferent in this matter; but just as soon as the universal law of the medical profession—that the specialist shall first be a general practitioner, and shall have no special degree—is complied with, the medical profession will at once assimilate this great new body."

A letter written in April, 1881, by Dr. James E. Garretson to Drs. Truman W. Brophy and E. S. Talbot, of Chicago, clearly depicts the views entertained by this distinguished surgeon regarding this subject. It is further amplified in a letter written by this author on March 11, 1882. These letters are reproduced as an interesting contribution to the history of the contention that then agitated the medical as well as the dental profession.

Philadelphia, April —, 1881.

Drs. Brophy and Talbot.

Gentlemen: I beg you will pardon delay in replying to communication first received; it has extended from day to day out of sheer inability to find time for writing.

All that you purpose can be carried through, but the term dentistry must be dropped and that of Oral Surgery, which includes it, be used.

The old-fashioned dentist is too closely related with the idea of the term to allow of its favorable reception by the Medical Society; my own feeling would lie in the same direction. Oral Surgery is dentistry, but dentistry is far from being Oral Surgery. If I understand the work being done by the gentlemen I address, I write to

Oral Surgeons. You and I represent not a profession, but a new surgical specialty; let us not make a mistake in forwarding its interests. The dentist must come to us; to unite the worker and student is all that Oral Surgery can do.

I assume the liberty arising out of age, to advise that you will call and hold yourselves Oral Surgeons. Go into the American Medical Association not as dentists, but as oral surgeons—as gentlemen of full medical education.

Dentistry is claimed by many as a profession; let it remain so and let all hold to that view who please. Join with those who are working to make a new specialty. The result is rapidly showing itself. If you conclude to use the term Oral Surgery I will be most happy in urging in your behalf any influence I may possess.

If possible I propose to be at the meeting as a member of the Philadelphia Medical Society.

With much regard,

J. E. GARRETSON.

Dr. Brophy.

Philadelphia, March 11, 1882.

My Dear Sir: I will not be able to make a visit to St. Paul this summer owing to an engagement which takes me to Europe; starting from here June 13th on the steamer Arizona. Let me express my warm and full interest in the object of our section and indulge the trust that the work done by it will properly and creditably represent the new specialty. Next year, if I live, I will, if possible, take a hand in the labor.

Very truly yours,

J. E. GARRETSON.

[The letters of Dr. Garretson were furnished by Dr. Truman W. Brophy.]

In 1881 Dr. Truman W. Brophy, of Chicago, read a paper before the New York Odontological Society, in which he strongly urged that the words "Dental and Oral Surgery" should be used to designate dentistry and displace the old time name "because these words more clearly represent, or indicate, the tissues upon which the educated dental surgeon is called upon to operate."

The question of admitting dentists to the conclave of the American Medical Association was seriously agitated at that time, but by reason of the fact that dentists as a class were not educated as doctors of medicine, they were not admitted at the meeting of this association, excepting such as held the medical degree.

In the meeting of the American Medical Association of that year, Doctors Gross of Philadelphia, Sayre of New York, and Davis of Chicago, moved that a section of oral surgery be added to the other sections of that body, which was adopted. Dr. Goodwillie, of New York, was appointed chairman, and Dr. T. W. Brophy, of Chicago, secretary, for this new section, both being practicing dentists. This was a recognition of the claims of oral surgeons to a position of specialists of medicine, but not of that of the profession of dentistry. It does not appear that any great advantage to the dental profession at large resulted from this movement. The desire to be known as oral

surgeons rather than as dentists or dental surgeons did not become very general, but many skillful oral surgeons have been developed out of the ranks of the dental profession as specialists in this department.

What was the conception of the scope of dental practice and the proper field for the operations of the dentist in the mind of Horace H. Hayden, the coadjutor and councilor of Chapin A. Harris, may well be learned from many of his utterances.

It seems clear that he contemplated that dentistry should embrace oral surgery and not that oral surgery should embrace dentistry. In August, 1841, he delivered an address before the American Society of Dental Surgeons in which he criticized John Hunter in these words: "In 1778, instead of encouraging practical dentists in the prosecution of physiological and pathological researches and experiments, with a view to the further development of the latter phenomena of this branch of the science, as it was supposed his writings were expressly intended for, he threw a kind of hindrance—a negative prohibition in the way which was calculated to check the ardor of scientific research, by saying:—'the diseases which may arise in consequence of those of the teeth, are various; such as abscesses, carious bones, etc., many of which, although preceding originally from the teeth, are more the object of the surgeon than the dentist, he finds himself as much at a loss in such cases as if the abscess or carious bones were in the leg or any other distant part. * * * All of the diseases of the teeth which are common to them with the other parts of the body, should be put under the management of the physician or surgeon—but those which are peculiar to the teeth and their connections belong properly to the dentist.'"

Hayden continues: "Very kind and very considerate indeed, in Dr. Hunter to avoid leading the cultivators of an immediate branch of his own profession beyond their depth or into error! Kind, indeed, in Mr. Hunter to avoid leading his countrymen beyond his depth and into matters of which, it is to be supposed, he has not acquired a competent knowledge. * * * If Mr. Hunter would have condescended to have cast his eye across the channel he would there have found the works of those whose names I have enumerated, and especially those of Jourdain, who was not afraid to lead the dentists of his country beyond their depth, but who twenty-two years before had written and published a work replete with valuable instruction of which every surgeon, physician and dental surgeon in Europe and America may read with great pleasure as well as advantage, and which every professional man ought to possess."

It will thus be seen that Hunter in the eighteenth century entertained the same views that are now held by the men who would substitute oral surgery for dentistry, while Hayden nearly seventy years ago believed that the term dentist was comprehensive enough, and that dentists should be competent to include in their profession and practice, surgical operations.

At the meeting of the National Dental Association in its session of 1900, held at Old Point Comfort, Virginia, a paper was read by Dr. N. S. Davis, M.D., LL.D., of Chicago, "On the relations of dental and oral surgery to the general field of medicine and surgery and the true professional status or rank of the properly educated practitioner of dental and oral surgery." In this Dr. Davis observed: "That 'medicine, surgery, and dentistry are actually departments of a common science' very few will be disposed to deny. I say 'a common science' in deference to popular custom. It would be more proper, however, to use the plural form of expression, for what is generally styled medical science is really an aggregation of (parts of) many sciences and their cultivation with direct reference to the prevention and alleviation of human suffering.

"Medicine, surgery and dentistry are all based upon chemistry, anatomy, physiology, pathology, and materia medica, consequently these five branches of medical study are fundamental, and no man can do full justice practically to the most limited specialty without a thorough knowledge of them all. * * *

"The dentist who restricts his work entirely to the processes of filling teeth may possibly acquire greater skill in that particular work than he would if, in addition, he extracted teeth, fitted artificial teeth, treated diseases of the mouth," etc.

Dr. Davis continues: "There is a natural basis on which a limited number of specialties can be founded with great advantage, and which, indeed, develop themselves by the natural and inevitable course of circumstances. For instance, the diseased deformities and defects of the dental organs, involving no immediate changes to life and requiring for the treatment of many of them special mechanical manipulations, naturally and almost necessarily constitute a special department of surgery. A department, indeed, that should be regarded as equal in importance and dignity, and consequently requiring equal education with every other branch of the profession. * * *

"Here it is eminently proper that in all large cities where the required opportunities are afforded men should devote special attention to such departments. But this can never justify or excuse any class of medical men for contenting themselves with only a partial medical education. * * * All

should be required to pass the same examining boards, be designated by the same title, M. D., and be governed by the same rules, both ethical and legal. Let there be in every medical college faculty a professor of dental and oral pathology and practice, on the same basis that you have a professor of ophthalmology, neurology, or gynecology. * * *

Thus it appears for a period of time, a mixed conception as to the title or name of oral surgery has existed, and a strong effort was made to apply the title of oral surgeon to medically educated dentists or those who held both degrees, but the great body of both the medical and dental profession, as well as the laity, seem to be quite content to consider the time honored name of dentist comprehensive enough to include all surgery of the oral cavity, including prosthesis and orthodontia.

So far as the record shows, Dr. James E. Garretson, of Philadelphia, was the first dentist recognized as a teacher of oral surgery under this title. He issued a work entitled "A System of Oral Surgery," which has run through many editions. From the fifth edition, published in 1890, a very extensive work of over 1,300 pages, one would be led to believe that oral surgery is but a new name for what had theretofore been designated and generally understood as dental surgery. The chapters of the book cover every branch of dentistry, including prosthesis and orthodontia. It makes all departments of dental science and art a part of oral surgery and substitutes the title or designation of "oral surgeon" and "oral surgery" for "dentist" or "dental surgeon."

Strenuous as has been the effort to secure this, and distinguished as have been the men who have advocated and stood for such a change, it has not met with general approbation. The long established and well-grounded custom of the other designation seemed to have been so strongly rooted that the "oral surgeon" has not superseded the dentist, but the word has been adopted and is well recognized now for the proper designation of that part of surgical work in dentistry or in surgery, which devotes itself to the specific care of the tissues of the mouth and adjacent parts, exclusive of the teeth and their sockets, not embraced in what is generally designated as "operative dentistry," and in the operations of which Dr. Garretson was the pioneer and most skillful dentist of his time.

Operative dentistry is now generally recognized as that portion of dental surgery which confines itself entirely to the treatment of the teeth and their immediate surroundings. This is evidenced by the fact that almost every dental college or school in the United States has a separate department of

oral surgery, distinct and apart from that of operative dentistry, and in charge of a special professor who gives didactic and clinical instruction in such specialty. That oral surgery is not now generally regarded as a synonym for dental surgery is also supported by the fact that the dental examining boards of the various states of this country in the test of the qualifications of dentists have instituted special examinations in oral surgery apart from that of operative dentistry, as does also the United States army dental examining board.

Great progress has been made in operations of oral surgery since the advent of Dr. Garretson as a specialist in this department of surgery or dental surgery. Many daring and skillful operations have been and are daily being performed in this department by men who are dentists, as well as by men who are general surgeons, and the number of specialists in this branch of surgery that have been developed from the ranks of the dental profession is larger, in proportion, than that coming from the medical profession.

Among the dentists who have especially excelled in this department of specialty of surgery may be named Drs. James E. Garretson*, J. H. McQuillen*, M. H. Cryer and W. J. Rowe of Philadelphia; H. A. Smith, of Cincinnati; J. Adams Bishop, T. B. Gunning; Norman W. Kingsley, G. L. Curtis, of New York; Thomas Fillebrown,* Boston; John S. Marshall, George B. Carpenter, Truman W. Brophy, E. S. Talbot, Thomas W. Gilmer, A. D. Black, W. H. Logan and F. B. Moorehead of Chicago; James E. Power and D. F. Keefe of Providence; G. V. I. Brown and G. B. Maercklein of Milwaukee; H. H. Grant of Louisville; S. I. R. McCurdy of Pittsburg and a number of others.

*Deceased.

Dental Education and History of Dental Schools

THE United States bureau of education, in a publication for 1907, accounts for fifty-six dental schools, in which there are engaged six hundred and seventy-six professors and six hundred and fifty-three special and assistant instructors. In these were enrolled six thousand seven hundred and eighty-eight men and eighty-eight women students. Of these only one hundred and thirty-two held literary degrees. There were graduated in 1906, 1,624. The value of grounds and buildings reported is \$1,770,681. The endowment fund is not in existence and the income exceeding benefices is stated at \$359,009. There were reported in the libraries of these schools 20,955 volumes. The schools are grouped by geographical divisions. In the North Atlantic Division in the states of Massachusetts, New York and Pennsylvania are ten schools with one hundred and six professors, two hundred and sixteen special and assistant instructors, two thousand and forty men and forty-six women students, of whom thirteen held literary degrees; four hundred and fifty-one were graduated. The value of grounds and buildings is stated as \$622,681; the income \$116,319, and the volumes in libraries as 1,771.

In the South Atlantic division, in the states of Maryland, Virginia, Georgia and the District of Columbia, are ten schools, with one hundred and two professors and eighty-eight assistants, and an enrollment of nine hundred and sixty-nine men and two women, of whom five had literary degrees; two hundred and forty graduated. The grounds and buildings are placed at \$30,000, the income at \$22,270 and the volumes in libraries at eight hundred.

In the South Central division, in the states of Kentucky, Tennessee, Alabama, Louisiana and Texas are eight schools, with ninety-two professors, and fifty-seven assistant instructors, and six hundred and fifty-three men students, of whom fifty-eight had literary degrees; one hundred and twenty-

nine graduated. The property value is placed at \$162,000, the income at \$38,650, and the number of volumes in the libraries at 750.

In the North Central division, in the states of Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri and Nebraska, are twenty-three schools, with three hundred and four professors and two hundred and forty-one assistant instructors, and an enrollment of two thousand six hundred and fifty-seven men and thirty-three women, of whom forty-six held literary degrees; six hundred and seventy-eight graduated. Property valuation is placed at \$795,000, income at \$116,970 and the number of volumes in the libraries at 17,334.

In the Western division, in the states of Colorado, Oregon and California, are five schools, with seventy-two professors and fifty-one assistant instructors, and four hundred and nine men and seven women students, of whom ten hold literary degrees; one hundred and twenty-six graduated. The property valuation is placed at \$160,000, the income at \$64,800 and the books in the libraries at 300 volumes.

In the bulletin issued by this bureau for 1908, fifty-seven schools are reported, with an enrollment of 6,919. The distribution of these schools is the same as in the year previous, excepting that the Western division has one more. From this report it also appears that in 1880 there were sixteen schools of dentistry, 730 students and 266 graduates. In 1890 there were twenty-seven schools, with 2,696 students and 943 graduates. In 1900 there were fifty-four schools, with 7,928 students and 2,029 graduates, and in 1907 there were fifty-seven schools, with 6,919 students and 1,754 graduates. This shows a decrease in the enrollment from 1900 to 1907 of 1,009 students, and a decrease in graduates of 275. During the same period the number of students in theology increased by 1,169; in law by 4,198; in pharmacy there was an increase of 1,005 students; in veterinary medicine there was an increase of 1,300 and in medicine a decrease of 1,493 students.

The cause for decrease in medical and dental students during the last seven years, which in both cases is most conspicuous in the last years, is probably ascribable to the increased entrance requirements in these professions.

In the matter of the values of grounds and buildings devoted to dental education, of income and volumes in the libraries, it is very apparent that the figures are not entirely reliable. So far as grounds and buildings are concerned, many of the buildings occupied are not the property of the dental schools or departments. In many cases they are rented, and in others they are

integral parts of the universities to which the departments belong and hence cannot be specifically valued. The same applies to income, which cannot be reliably stated, as numbers of schools do not report this at all. The most unsatisfactory of all the items in this government statistical statement is the report of the libraries. It is evident that the schools have not made a detailed report, as the volumes in the libraries undoubtedly are double those stated.

It is a much deplored fact, and yet perhaps a matter of great pride, that all the great effort and accomplishment of dental education has been achieved without the receipt of a single dollar in benefactions and without the existence of an endowment fund. The late Dr. W. D. Miller at one time referred to the dental profession as "self made." The items in this government report warrant the conclusion that dental education has been self made, and that tuition paid by students, who now constitute the profession, paid for equipment and sustained the teachers.

The late Dr. Thomas W. Evans, of Paris, France, left an estate approximating one million dollars for the establishment of a dental institute in Philadelphia, a school of higher learning, that has not yet been established. His is a worthy and needed example to others. That dental colleges and schools and dental departments of universities now existing have thus far maintained themselves without being the recipients of bequests or benefices similar to those received by other professional schools and made the progress they have, is typical of the genius of our profession.

In 1902, the United States Census Bureau, in its educational section, published a table of statistics with reference to dentists, which included those who entered the profession by graduation and otherwise, from 1841 to 1901. From this it appears that there were then 28,142, of whom 16,831 were graduates from dental colleges, and 11,311 were non-graduates. Alaska among the dentists practising there, had only four per cent. of graduates, and Idaho thirteen per cent. The total percentage of graduates then practising in the United States was less than sixty. The District of Columbia and nineteen states are above this average. All the other states and territories are below it. The distribution as shown by this table by states is as follows:

State	Graduates	Non-Graduates	Total	Per cent Graduates
Alabama	200	203	403	49
Alaska	1	23	24	4
Arizona	20	22	42	48
Arkansas	91	139	230	39.5
California	719	524	1,243	57.6

HISTORY OF DENTAL SURGERY

State	Graduates	Non- Graduates	Total	Per cent Graduates
Colorado	198	119	317	62.4
Connecticut	207	199	406	51
Delaware	44	16	60	73.3
District of Columbia .	208	48	256	81.2
Florida	81	75	156	52
Georgia	333	199	532	62.6
Idaho	14	94	108	13
Illinois	1,618	644	2,262	72.4
Indian Territory	15	128	143	10.5
Indiana	627	296	923	66.8
Iowa	718	367	1,085	66.1
Kansas	300	264	564	53.2
Kentucky	351	230	581	60.4
Louisiana	149	167	316	47.1
Maine	117	202	319	36.7
Maryland	284	155	439	64.9
Massachusetts	930	458	1,388	67
Michigan	620	399	1,019	60.8
Minnesota	394	181	575	70.2
Mississippi	104	172	276	37.6
Missouri	676	438	1,114	60.6
Montana	35	78	113	30.9
Nebraska	154	188	342	45
Nevada	6	13	19	31.6
New Hampshire	83	109	192	43.2
New Jersey	329	184	513	64.1
New Mexico	17	12	29	58.6
New York	1,760	1,270	3,030	57.7
North Carolina	177	127	304	58.2
North Dakota	50	31	81	61.7
Ohio	1,213	699	1,912	63.4
Oklahoma	62	51	113	55
Oregon	60	181	241	24.8
Pennsylvania	1,879	703	2,582	72.7
Rhode Island	81	87	168	48.2
South Carolina	142	73	215	66
South Dakota	54	77	131	41.1
Tennessee	247	213	460	53.6
Texas	304	434	738	41.3
Utah	45	94	139	32.3
Virginia	235	175	410	57.3
Vermont	65	86	151	43
Washington	116	134	250	46.6
West Virginia	98	201	299	32.8

State	Graduates	Non-Graduates	Total	Per cent Graduates
Wisconsin	585	302	887	65.9
Wyoming	15	27	42	35.6
	16,831	11,311	28,142	59.08

Since this government statistical report was made the number of dentists in the United States, as well as the population, has greatly increased, as will appear from the following tables:

TABLE OF DISTRIBUTION OF THE DENTISTS OF THE UNITED STATES AND CANADA BY STATES AND TERRITORIES BASED UPON POPULATIONS ESTIMATED FOR 1907 AND POLK'S DENTAL REGISTER FOR 1908.

States	Population to Each Dentist	Population by Thousands	Number of Dentists
Alabama	4,000	2,018	504
Alaska	2,820	93	33
Arizona	3,725	149	40
Arkansas	4,373	1,422	303
California	1,063	1,648	1,550
Colorado	1,426	616	432
Connecticut	1,593	1,006	625
District of Columbia	970	308	329
Delaware	2,644	195	73
Florida	2,872	629	219
Georgia	3,754	2,444	650
Hawaii	8,348	192	23
Idaho	1,324	206	148
Illinois	1,755	5,419	3,081
Indiana	2,300	2,711	1,179
Iowa	1,854	2,210	1,193
Kansas	2,111	1,613	764
Kentucky	3,115	2,320	748
Louisiana	3,747	1,540	411
Maine	1,836	714	389
Maryland	2,560	1,275	498
Massachusetts	1,634	3,043	1,862
Michigan	1,858	2,582	1,353
Minnesota	2,670	2,026	759
Mississippi	4,724	1,708	357
Missouri	2,290	3,363	1,469
Montana	2,054	304	148
Nebraska	2,000	1,069	534
Nevada	933	42	45
New Hampshire	2,005	433	216
New Jersey	2,806	2,196	779
New Mexico	3,000	216	72

HISTORY OF DENTAL SURGERY

States	Population to Each Dentist	Population by Thousands	Number of Dentists
New York	2,093	8,227	3,930
North Carolina	5,163	2,060	399
North Dakota	2,955	464	157
Ohio	1,945	449	2,236
Oklahoma	2,312	1,119	484
Oregon	1,253	475	379
Pennsylvania	2,125	6,929	3,260
Philippine Islands	13,702	7,636	55
Porto Rico	2,530	1,037	41
Rhode Island	2,076	490	236
South Carolina	4,572	1,454	318
South Dakota	2,440	466	191
Tennessee	3,590	2,172	605
Texas	3,779	3,537	936
Utah	2,012	316	157
Vermont	2,058	350	170
Virginia	4,180	1,973	472
Washington	1,334	615	461
West Virginia	3,233	1,076	333
Wisconsin	1,932	2,260	1,169
Wyoming	2,166	104	48
	2,414	88,919	36,823

CANADA.

Alberta	25	60
British Columbia	177	66
Manitoba	255	78
New Brunswick	331	76
Newfoundland	224	5
Nova Scotia	460	116
Ontario	2,183	807
Prince Ed. Isle	109	19
Quebec	1,700	235
Saskatchewan	11	41
Yukon		12
	5,375	1,515

The enactment of state laws requiring examinations of men who had no diplomas from dental schools by boards of dental examiners, had far reaching educational result.

Boards that were at all exacting in their demands upon candidates frequently rejected them because of insufficient knowledge or skill. Such

candidates soon learned that the easiest and most satisfactory way to prepare themselves for admission to practice was to enter a dental school and obtain a diploma.

This created a demand for more dental colleges and resulted in the organization of a large number. Unfortunately it encouraged the creation of many such institutions which were of no value, excepting perhaps to their proprietors as a means of obtaining fees from students. The privilege granted to graduates of dental colleges—the right to practice without examination by state boards—had much to do with the changing of the laws of many of the states of the Union. Only one state now remains, Kansas, that recognizes the dental diploma as a final certificate, entitling the holder to practice dentistry, without requiring further test of his skill and knowledge to be given to its state dental board.

Among such schools which caused world wide attention was one organized under a charter given by the state of Wisconsin on July 17, 1880, known as the Wisconsin Dental College, located at Delavan. From its fifth annual announcement, issued in 1884, it appears that its faculty consisted of two professors, teaching dental pathology and dental therapeutics, and anatomy and surgery respectively. There was also a demonstrator of operative dentistry and a demonstrator of mechanical dentistry.

A dentist of five years practice could enter the course at any time during the session, be examined and if found qualified, receive the degree of doctor of dental surgery. The announcement says: "By thorough application, while at this college, to studies, theoretical and practical, the student may, with the necessary qualifications, graduate at the end of one term." The term commenced on the 16th of October, 1884, and closed in the March following.

There were graduated during the first year nine candidates, of whom six came from Pennsylvania, one from South Carolina, one from Illinois and one from Manitoba. The next year it had a graduating class of nine, of whom four came from Pennsylvania, two from Wisconsin, one from Minnesota, one from Iowa and one from Virginia. The third class consisted of eleven, of whom two were from Pennsylvania, three from New York, two from Wisconsin, one from Ohio, one from Canada, one from Manitoba and one from Illinois. The fourth year the reputation of the school and the ease with which, if not a dental education, at least a dental diploma could be obtained from it, seems to have become world wide; but the profession in this country appears to have lost confidence in the institution. In that year there were twelve graduates, of whom five were in Germany, two in England, one in

Ontario, one in the District of Columbia, one in Iowa, one in Ohio and one in Wisconsin.

Although this college was legally organized under the general law of the state in 1880, the state dental society denounced the institution in 1881, and after the passage of the dental law in 1885, it was declared as not reputable by the board of dental examiners of the state. The National Association of Dental Examiners, in August, 1885, sustained the action of the Wisconsin board. Only one of the diplomas of this college was ever presented for the consideration of the Wisconsin board, and the holder was refused a license. There was only one dentist in the faculty. It was stated officially that this institution was used for the purpose of making money, by the sale of honorary diplomas, for its founder, whose death occurred early in 1886.

Soon after this the institution received so much adverse advertising and its graduates so much contempt, that it went out of existence so far as attempting any practical work is concerned, although it is alleged that it issued diplomas for a considerable period thereafter.

In Illinois the first charter for a dental school was obtained in 1869 for the Chicago Dental College. It was issued to a group of gentlemen whose names have since been intimately interwoven with the history of the state and the nation. They were Horace White, A. N. Towne, Thomas Drummond, Francis Murison, Robert Collyer, George S. Bowen, George Hibben, Robert L. Ray, Samuel B. Noble, John B. Rice, George H. Cushing and Robert C. Hammell. This charter never came into active operation. Another charter for a "Chicago Dental College" was obtained in 1878; that charter also remained unused, and both of them were cancelled in 1902. The history of the Chicago College of Dental Surgery, organized in 1883, and its successful educational work is fully set forth in this chapter.

Under the impulse of the great demand for dental diplomas, largely under the allurements of financial gain, there were organized in Chicago, under charters of the state, in 1885, two dental colleges: Illinois Dental College and the Northwestern College of Dental Surgery. In 1886 the American College of Dental Surgery came into life. In 1887 three dental colleges were chartered: The Northwestern Dental College of Chicago, the University College of Dental and Oral Surgery and the University Dental College. In 1888 the German American Dental College of Chicago was organized. In 1889 the Chicago College of Dentistry came into being. In 1890 the American and European Dental College and the United States Dental College came into life. In 1891 the Illinois College of Dentistry was organized. In 1892 three

new colleges arose: the Northside Dental College and Infirmary, the North American College of Dental Surgery and the Northern College of Dental Surgery. In 1895 the National College of Dental and Oral Surgery came into existence. In 1896 the Standard Dental College was organized. In 1897 the Institutium Dentale Columbianum was created and in 1898 the International College of Dental Surgery came into life. The American University of Medicine and Dentistry was chartered in 1901, as was also the Chicago Post Graduate School of Prosthetic Dentistry and the Prairie State College of Dental Surgery.

The year 1902 seems to have been the last year of prolific development in dental educational institutions in the state of Illinois. There were organized in that year the American Post Graduate College of Dentistry, the Haskell Dental College of America, the Haskell Post Graduate School of Prosthetic Dentistry and the Union Dental College.

Many of these schools were chartered for purely business purposes. The moral effect of the campaign waged against diploma factories seems to have become effective from this time on. No attempt to charter a dental school has been made in Illinois for seven years, and the records in the secretary of state's office in Springfield show that in 1902, seventeen charters of the institutions named were cancelled. In 1903, three of these charters ceased to exist, in 1904 another expired, as did also one in 1905. Out of this multitude of dental school creations there are now only three under-graduate dental schools actively in operation.

It is believed that the mania for organizing dental colleges was greater in Chicago and Illinois than in any other portion of the world. The fact that under the statutes only reputably conducted dental schools could have their diplomas recognized as valid by dental boards, very soon influenced the cessation from active operation of spurious schools, and the discrediting of diplomas issued them by dental boards destroyed the value of most of these dental charters. In several instances, however, the charters were surrendered by reason of the consolidation of some of the schools with the schools now in existence.

The educational conditions and struggles of development were so correctly and fairly stated by the late Dr. W. D. Miller, of Berlin, in a monograph written and published by him in 1901, that although much progress has since then been made in this matter, his views and words are here in part reproduced:

In America the final separation of the dental from the medical profession was only completed in the year 1851. In 1839 a college was founded in Baltimore, which was

entirely independent of the medical school and had for its purpose the special education of persons for dentistry. As the curriculum of this school did not correspond with that of the medical school, the American Medical Association resolved, in Charleston, that schools or colleges which simply taught dental science or pharmacy could not be acknowledged by it, as being entitled to send delegates to its meetings.

At the time of the founding of this Baltimore Dental College there were many distinguished dentists in America who declared themselves not at all satisfied with the dissolution of dentistry from medicine. Even at the present day there is also, with us in Germany, much difference of opinion between those who again seek for a closer attachment to the general practice of medicine, and those who look upon dentistry as a separate profession, which although in many particulars closely related to medicine, is yet in many respects so far removed from it that they would consider it useless that the education of a dentist should be the same in every point as that of the general medical practitioner.

The first dental school in the world was founded in 1839, at Baltimore. The Pennsylvania College of Dental Surgery followed in 1853, the New Orleans College of Dentistry, in 1861* and in 1863 the Philadelphia Dental College. From this time on there began on an average a new school every year. They now number about sixty.

The views which are now held all over Germany in reference to the character and aspirations of these schools are, so far as they represent actual conditions, practically incomplete and practically they do not represent these conditions at all. They characterize conditions as they were twenty-five years ago nearly correctly, but give a most perverse general presentation of what now is. It is not very easy to obtain a clear picture of the conditions existing over there, because there are all possible gradations, beginning with those schools which are a real adornment, down to mere business enterprises and swindle institutions which issue and sell their diplomas without curriculum.

Not at all in keeping with the real conditions of things, and entirely unjust, is the opinion which here and there becomes apparent that the American dental schools are only business ventures. There are private schools over there which without doubt aim to arrive at a considerable profit and whose existence depends upon this profit, but it is distinctly going too far, when one maintains that even these schools, with few exceptions, were not making an effort to elevate themselves, the interests of the students attending them, and of the public. On the other side there is a large class of schools whose control in large part, does not rest in the hands of the teachers, and whose teachers receive an established remuneration without participation in the college fees, and to whom, so far as it involves their income, it is absolutely immaterial whether the school is attended by one or a thousand students.

Aside from this the conduct of these institutions rests in the hands of men of unassailable reputations, who are interested only in the highest ideals and good of the profession. A few of the dental schools in the United States are state institutions, as for instance that of the universities of Michigan, Minnesota, Iowa, and perhaps one or two more. Otherwise thirty-two of the fifty-two schools which are members of the faculties association are departments of universities or of medical colleges.

Twenty-five years ago, when there were only a few dental schools in existence in America, the most of them required no evidence of any previous education from their matriculates. The prescribed time for study amounted to two years of from four to five

*This college went out of existence. The Ohio College was founded in 1845.—Editor.

months in each year. There existed also an unfortunate provision giving to such as had been in dental practice for several years previously a credit of one year (four months.) These four months to him who was late in reporting were still further shortened, so that the period of study in such cases amounted only to weeks instead of years and months.

Under these circumstances it became possible to foreigners, and especially Germans, without regard to preliminary education, to travel to America and to return in a few weeks with a doctor's degree. As the evidence of having been in dental practice for several years was in most cases not difficult to establish, it appears that the necessary care to prove the value and genuineness of such practice was not always taken over there.

Aside from these unfortunate conditions, there arose from time to time institutions which without any curriculum sold diplomas (Dokortitel), and forsooth these found their best customers in Germany. In the neighborhood of four hundred such diplomas are said to have been disposed of in Germany. In recent days the foreign relations committee (of the National Association of Dental Faculties), with Dr. Barrett at the head, and above all the American consul, Woerman, in Munich, have proceeded right sharply against these diploma factories, and there is reason to hope that we shall be free from these institutions and that their leaders may not escape deserved punishment. That our American colleagues are ready to make a sacrifice to accomplish this aim is indicated by the fact that at a meeting in Milwaukee thirteen thousand, and later again, four thousand marks were contributed for the purpose of prosecuting these diploma swindlers.* * *

How difficult it is to suppress such a diploma factory is indicated by the fact that a well-known factory, the Independent Medical College of Chicago, possessed not less than twenty-four charters and manufactured thirty-six different doctor titles. As soon as one charter was taken away from it, it could enter another name and manufacture further. This factory is supposed to have sold over a thousand doctor degrees at prices ranging from five to five hundred dollars. When one charter was withdrawn it quickly rose again under the name of the Cosmopolitan Medical College. The dentists over there are as little responsible for this as the dentists here are for the much greater disgrace that so many purchased titles are carried here. A man who sells a title is not as contemptible as he who knowingly purchases and carries a false title. In Germany we have no ground whatever to be proud of our four hundred purchased titles, and it is the duty of those associations which are engaged in matters concerning professional standing to strive in the direction that most of these purchased diplomas should be exposed and their holders punished. * * *

But these diploma factories did not in any way influence the development of dental science in America. The profession as a whole has scarcely been in any manner affected by it. The circumstances mentioned that on the part of acknowledged schools diplomas were issued after a very short period of study and without reference to preliminary education were looked upon as a great evil. The American dentists who practiced in Germany filed their complaints repeatedly in the meetings of the American Dental Society of Europe, especially during the time when I presided, in the beginning of the '80's, against those schools which conferred their diplomas in a careless manner; at the same time a more thorough course of dentistry and more severe examinations were demanded in America itself.

At this period arose two organizations which are destined to exercise an influence upon the development of dental educational matters in America—the National Association

of Dental Examiners, 1883, and the National Association of Dental Faculties, 1884; the first forms a union of the state boards of dental examiners, whose purpose it is to secure a high and uniform standard for dental practitioners. The second organization, with which we have mainly to do, is the union of the faculties of dental schools with a purpose to further the interests of dental instruction. * * *

In the first session of the National Association of Dental Faculties, it was resolved that in all schools of the association, five, or even twenty years' practical work, should no longer take the place of one of the two study years, but that all students should be required to attend the school two full years.

Further, it was resolved that entrance examinations should be demanded from all candidates who do not present proof of a sufficient preliminary education. Year by year more new schools joined this association until now their number reaches fifty-two. The progress which has been made in dental science in America during the last fifteen years is in a high degree due to this association and the National Association of Dental Examiners, because they gradually demanded a higher preliminary education and an enlarged dental course of studies, so that now the preliminary requirements are not far behind those demanded here, while a dental education there surpasses that prescribed in Germany. At this place it may be mentioned that the reputable schools in America now demand two years of study from approved dentists (*approbierten Zahnärzten*) before they can reach the doctor's degree.

BALTIMORE COLLEGE OF DENTAL SURGERY.

BALTIMORE, MD.

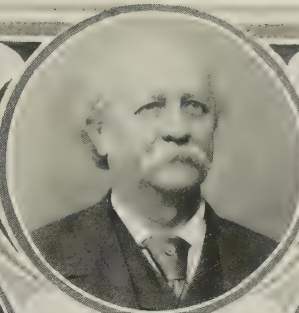
BY WILLIAM SIMON, PH. D., M. D.

It is significant that the teachers of the first dental school were also prime movers in the establishment of the first dental journal and the first dental association. They were Horace H. Hayden and Chapin A. Harris, whose energetic, far-sightedness and unselfishness, we now realize was conspicuous. Their willingness to give freely to others was an essential necessity for the up-building of a successful and useful dental school.

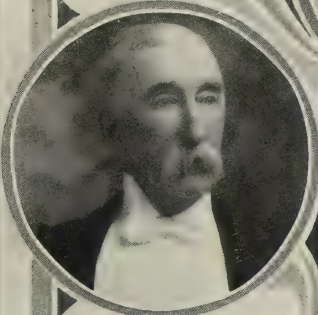
Hayden, shortly after beginning practice in Baltimore, gave instruction in dentistry to classes in his office at night, which he carried along until the formation of the Baltimore College of Dental Surgery.

The medical faculty of the University of Maryland invited him to give a course of lectures before the medical class in the session of 1837-38. This attempt at teaching dentistry by means of lectures was probably the seed sown from which germinated the college under consideration not long thereafter.

Chapin A. Harris commenced his medical studies and began practice in



R. B. WINDER, M.D., D.D.S.
DEAN, 1882-94



M. W. FOSTER, M.D., D.D.S.
DEAN



1839



W. SIMON, M.D.
PROF. OF CHEMISTRY



BALTIMORE COLLEGE
OF
DENTAL SURGERY



WILLIAM B. FINNEY, D.D.S.
PROF. OF PROSTHETIC DENTISTRY



B. HOLLY SMITH, M.D., D.D.S.
PROF. OF OPERATIVE DENTISTRY

Ohio. Later, having become interested in dentistry, he moved to Baltimore, where he expanded in this specialty under the guidance of Hayden. He was young, aggressive, ambitious, full of energy and thoroughly equipped mentally to aid Hayden's ambitions of elevating dentistry to the rank of a profession.

In the founding of the college, the activity of Harris was of inestimable



MEMORIAL TABLET OF HAYDEN AND HARRIS

value. Hayden's age of seventy was no barrier to the success of the enterprise as the vigor and intelligent enthusiasm of Harris was at his disposal for its accomplishment. Probably neither of these men alone could have succeeded. Interchange of their minds and the uniting of their powers were the agency that made the college a final reality. Harris was a man of science, but acquainted with practical affairs as well. Hayden became the lecturer on dental pathology and physiology, and Harris was the professor of practical dentistry. Dental education was uppermost in the mind of Hayden and in Harris the man was found to look after matters of detail. The securing of a charter, the gathering of compatible teachers, and creating other ways and means to achieve the end was the work of Harris. Hayden became, and was until he died, the president of the college. The institution from the day of its birth was a complete success. Mr. Ernest W. Keyser, the sculptor, modeled

in relief, the heads of the two men, showing them life size in the prime of life. Two of these tablets, cast in bronze, were dedicated with appropriate ceremonies in the winter of 1902-03, one at the Baltimore College of Dental Surgery and the other in the dental department of the University of Maryland.

Dr. Eugene F. Cordell wrote: "The founders of the school first endeavored to engraft it upon the university as a separate department of the same. Being unsuccessful in this, doubtless owing to the unsettled condition of the latter, which had shortly before been rent in twain and was just emerging from a nearly fatal lawsuit, they boldly launched out upon the untried sea with an independent school. Their immediate and marked success showed that the movement was opportune and that they supplied a real want."

The faculty of the university, in a letter rejecting the proposition addressed to Dr. Harris, said that "the subject of dentistry was of little consequence and thus justified their unfavorable action."

To establish the degree of Doctor of Dental Surgery was decided upon between these two men, after the decision to start an independent dental school had been reached. A charter was applied for and granted by the legislature in session at Annapolis. It reads as follows:

AN ACT INCORPORATING THE BALTIMORE COLLEGE OF DENTAL SURGERY.

Passed February 1, 1840.

Section I. Be it enacted by the General Assembly of Maryland, that a college of dentistry be, and the same is hereby established in the City of Baltimore, to be known and designated by the name and style of The Baltimore College of Dental Surgery.

Sec. II. And be it enacted that the following persons be and are hereby appointed and constituted the Professors of said College, to-wit: Horace H. Hayden, M. D., to be professor of Dental Pathology and Physiology; Chapin A. Harris, M. D., to be professor of Practical Dentistry; Thomas E. Bond, Jr., M. D., to be professor of Special Dental Pathology and Therapeutics; and H. Willis Baxley, M. D., to be professor of Special Dental Anatomy and Physiology.

Sec. III. And be it enacted that the said professors and their successors shall be, and are hereby declared to be a corporation and body politic, to be perpetuated under the name of the Baltimore College of Dental Surgery.

Section VII states that the professors and their successors shall hold at least one term in every year for the period of four months, for the purpose of delivering lectures and instruction in the different branches of dental science, for which they are empowered to charge such fees as they deem proper.

Section VIII. And be it enacted that R. S. Stewart, M. D., Joshua T. Cohen, M. D., Thomas E. Bond, M. D., Thomas C. Risteau, M. D., Rev. John G. Morris, Rev. Beverly

Waugh, John H. Briscoe, M. D., Samuel Chew, M. D., Rev. George C. M. Roberts, M. D., John James Graves, M. D., Rev. Dr. J. P. K. Henshaw, Rev. James G. Hamner, John Fonerden, M. D., Leonard Mackall, M. D., and Enoch Noyes, be appointed a Board of Visitors, to be styled the Board of Visitors of the Baltimore College of Dental Surgery, who shall be empowered to examine into the state and condition of the institution, and see that the requirements of this Charter are fulfilled.

Sections IX and X contain provisions for conferring the degree of Doctor of Dental Surgery on students having been found worthy of it after an examination, and of conferring the same honorary degree on any dentist who may have rendered service to the science, or distinguished himself otherwise in his profession.

This charter was similar to those of medical schools. The charter was granted on February 1st, and relates that:

A meeting of the faculty of this institution was held February 3, at half past seven o'clock P. M., at the house of Dr. H. H. Hayden, with a view to its organization by the election of a president and dean.

On motion, Dr. H. H. Hayden was appointed chairman and Dr. C. A. Harris secretary. A motion was then made that the faculty proceed to the election of the officers above named; whereupon Dr. H. H. Hayden was nominated and elected president and Dr. C. A. Harris, dean. There being no other business before the faculty, it adjourned.

To secure students for the first session was the next effort, Dr. Baxley wrote:

The practical inauguration of the new college presented a difficulty well known in America where professors often outnumber students. At length five legitimate students were found to covet the honor of the new title, D. D. S., and the first course of instruction was given in the winter of 1840-41. The didactic lectures were delivered in a small room, publicly situated, but the teaching of practical anatomy demanded privacy; other prudential considerations also suggested the use for that purpose of a secluded stable loft.

At the faculty meeting held May 15, 1840, it was decided to insert a proper advertisement in the following journals or newspapers: "National Intelligencer," "Globe," "Philadelphia U. S. Gazette," "Louisville Journal," "American Journal of Dental Science," "American Journal of Medical Sciences," "Maryland Medical and Surgical Journal," "Baltimore American," "Patriot," "Charleston Courier" and "Baltimore Pilot." An "Annual Announcement of the Board of Visitors" was also issued to further secure publicity. Five students for the first session were the result. The names of these students were: J. Washington Clowes, of New York City; Thomas Payne, of New

York City; Robert Arthur, of Baltimore; Joseph Lavier, of Norfolk, Va.; R. Covington Mackall, of Baltimore.

Dr. Harris, on November 3, 1840, delivered the introductory lecture, and lectures and practical instruction continued to the latter part of February, 1841. According to the provision of the charter two students could become candidates for graduation after attendance of but one session. These two candidates were Robert Arthur and R. Covington Mackall, of whom we learn that "each having defended a thesis and sustained a satisfactory examination, the faculty resolved to admit them to the degree of Doctor of Dental Surgery."

Dr. Hayden conferred the first degrees on March 9, 1841, Dr. Bond delivered the valedictory. After the close of the first session honorary degrees of D. D. S. were conferred on a number of prominent dentists at home and abroad. Diplomas were sent to Canada, England, Scotland and France. In some cases the request for honorary degrees were granted at once, in others inquiries into the professional standing of the applicants were instituted before the faculty honored such requests, and some applications were laid on the table.

Under the charter any reputable dentist could apply for an examination, and dentists who failed to obtain the honorary degree applied for examination themselves in order to secure the D. D. S. degree. Candidates were required to submit a thesis and specimens of their mechanical work; they were also required to demonstrate their operative skill on a patient, and subjected to an oral examination. All applicants did not succeed in securing the diploma. In the minutes appears the following:

Dr. S., a practitioner of dentistry of fourteen years, was admitted to the examination for the degree of D. D. S., and rejected as altogether unworthy of the honor, as he showed no acquaintance with the science of dentistry, being nothing but a dental mechanic.

From the beginning both theoretical and practical instruction were given, the facilities for the latter were rather limited until 1846. That year the first dental infirmary was established. As early as 1843, the college had a demonstrator of mechanical dentistry, and, in 1846, also a demonstrator of operative dentistry.

In 1852, the chair of "practical dentistry" was divided by the establishment of a chair of mechanical and a chair of operative dentistry. The faculty was constantly alert in its efforts to expand the course of instruction. The number of students steadily increased. In 1841, there were but two students to graduate and, in 1851, eighteen students received their diplomas.

Beginning with the year 1848, members of the faculty were appointed annually as delegates to the meetings of the American Medical Association.

Ten years after its birth found the dental college occupying an acknowledged position as a valuable agent in dental and medical progress. Thus the Baltimore college has exerted an influence that is difficult to measure now; it was the precursor and first type of a special school, and it furnished the charts and compass that aided subsequently organized colleges greatly. If imitation is the highest form of flattery, the Baltimore College of Dental Surgery has certainly cause for pride. It set the pace which has been followed in many other cities. Its alumni have the right to claim a large place among the men to whom is due the honor conceded to the name of "American dentist" all over the civilized world.

The museum of the college contains many objects of historic and scientific interest. The collection of prosthetic specimens is particularly rich, representing the various stages through which prosthesis has moved onward to the present day. Among these are: A lower denture made in France with the eight posterior teeth carved in ivory, and the other eight (natural) teeth attached to the plate by means of wooden pivots; a full upper and lower carved in ivory, the plate and teeth being continuous; an old lower set from England, carved in ivory, with holes for riveting the teeth; partial uppers carved in ivory; a full upper denture, the plate and six posterior teeth carved in ivory, the other teeth porcelain, mounted by means of gold pins and cylinders.

The pathological collection is also very extensive.

One of the requirements for graduation for candidates is to submit specimens of mechanical or operative skill. Over a thousand of such specimens are found in the museum. The collection of the skulls with the teeth in situ of a great number of animals facilitates the study of comparative dental anatomy.

Of historic interest is a collection of some of the instruments used a century ago in dental surgery; a molar extracted from the mouth of Amadeus I., king of Spain, and presented to the college by J. C. Gardiner, D. D. S., of London: another molar is one which evidently caused King George IV discomfort until relieved by Robert Wooffendale, of London.

Here are found the death masks of Benjamin Franklin, Sir Isaac Newton, King George III, Willis, the painter; Roberts, the engraver; Zip, Barnum's "What-is-it" of circus days gone by, and many others.

The ivory carved teeth, made by John Greenwood, for George Washington, are now in the museum of the oldest of all dental colleges. This highly prized

specimen was presented to the college by Dr. John Allen, who obtained it from a grandson of Dr. Greenwood.

Here are found portraits of the founders of the college, Hayden and Harris; of John Greenwood; of Drs. Robert Arthur and R. C. Mackall, the first graduates in dental surgery, and also of many others who assisted in the advancement of the profession.

The office of president of the college was held by Horace H. Hayden from 1840-1844, and from 1844-60, by Chapin A. Harris, each of them serving until his death. Eleazar Parmly was its provost from 1847-1852, when he resigned. The deans of the college have been Chapin A. Harris, 1840-41; Thomas E. Bond, 1841-2; Washington R. Handy, 1842-53; Philip H. Austin, 1853-65; Ferdinand J. S. Gorgas, 1865-82; Richard B. Winder, 1882-94, and M. Whilldin Foster, from that date. And aside from these names in the faculty there appear many of the highly honored names of the profession, among which are Amos Westcott, Cyrenius Cone, Alfred A. Blandy, Edward Maynard, B. Holly Smith, James B. Hodgkin, William B. Finney, Henry R. Noel, H. Willis Baxley, Washington R. Handy, A. Snowden Piggot, Russell Murdock, E. Lloyd Howard, Thomas S. Latimer, Standish McCleary and many others.

Its 2571 alumni are scattered all over the world; among these there have been many men of great prominence in the profession who have made reputations, not only as practitioners, but also as investigators, teachers, members of state boards, writers, inventors and leaders in the progressive work of science.

Its first graduating class produced Robert Arthur; in the class of 1842, W. W. H. Thaxton became distinguished. In the class of 1848, John McCalla, who afterwards became one of the organizers of the Pennsylvania College of Dental Surgery, and of the Odontological Society of Pennsylvania, was a distinguished member. To this college we are indebted for W. H. Morgan, for so many years the leader of dental thought and progress in Tennessee, who was for a number of years a trustee of the Ohio Dental College, and later became intimately associated with the dental department of the Vanderbilt University, in which he served as dean.

The class of 1851 produced Dr. Frank P. Abbot, who shortly after graduation went to Berlin, Germany, and became one of the early pioneer American dentists of Europe.

Samuel J. Cockerille, of the class of 1853, became a very distinguished professor of Washington, D. C.

The class of 1854 developed Dr. F. H. Rehwinkel as a dentist, who previously had received a medical education at a university in Germany and prac-

ticed in Natchez, Miss., having reached this country in 1849. He established himself at Chillicothe, Ohio, and became a leader in the effort of professional expansion. He held many offices of distinction in dental and medical societies and contributed extensively to dental literature.

The class of 1857 brought forth Henry Hobert Keech, who became later a very distinguished teacher of anatomy and dental pathology and therapeutics.

Dr. Henry Bliss Noble, who for many years was one of the most distinguished dentists of the District of Columbia and a member of the board of examination there, was also a member of the class of 1857. He gave much attention to specializing in orthodontia, and was connected with the teaching staff of the Baltimore College of Dental Surgery, and also of the dental department of Columbia University.

Benjamin H. Catching, of the class of 1870, was one of the most prominent men in his profession, not only in the state of Georgia, but in the south. He was the founder of the "Southern Dental Journal," and gave many years to work in dental journalism and dental literature.

Space prevents my naming all the men of distinction in the dental profession who received their initial impulse in this first dental college of America, but among many others, we feel that the names of Benjamin F. Arrington, of North Carolina, 1853; Ferdinand J. S. Gorgas, of Baltimore, Md., 1855; Linas Edmund Turner, of Raleigh, N. C., 1858; James H. Harris, of Baltimore; James B. Littig, of New York, and Luther D. Shepard, of the class of 1861; W. W. Evans of Washington, D. C., 1863, and T. S. Waters, of the class of 1865, deserve especial mention.

Although this school is the oldest dental school in the world, it remains constantly abreast of the progress of the times and continues faithfully in the good work of higher dental education under the inspiration of its founders, which is constantly sustained by the faculty of the present day, (1908) which consists of:

M. WHILLDIN FOSTER, M. D., D. D. S., Professor of Therapeutics and Pathology.

WM. B. FINNEY, D. D. S., Professor of Prosthetic Dentistry and Metallurgy.

B. HOLLY SMITH, M. D., D. D. S., Professor of Dental Surgery and Operative Dentistry.

WILLIAM SIMON, PH. D., M. D., Professor of Chemistry.

CHARLES F. BEVAN, M. D., Clinical Professor of Oral Surgery.

J. W. CHAMBERS, M. D., Professor of Anatomy.

WM. F. LOCKWOOD, M. D., Professor of Materia Medica.

W. G. FOSTER, D. D. S., Professor of Operative Technique and Demonstrator of Operative Dentistry.

GEO. E. HARDY, M. D., D. D. S., Professor of Physiology.

T. S. WATERS, D. D. S., Professor of Clinical Dentistry.

C. M. GINGRICH, D. D. S., Professor of Clinical Dentistry.

E. HOFFMEISTER, PH. D., D. D. S., Professor of Materia Medica and Demonstrator of Chemistry.

STANDISH MCCLEARY, M. D., Professor of Anatomy.

CLARENCE J. GRIEVES, D. D. S., Professor of Comparative Anatomy and Dental Histology.

KASSON C. GIBSON, N. Y., Professor of Oral Deformities and Fractured Maxillaries.

OHIO COLLEGE OF DENTAL SURGERY.

CINCINNATI, O.

BY H. F. SMITH, D. D. S.

In any consideration of the early history of this school there is one fact that stands out conspicuously, that is, the school's intimate connection with the establishment of dentistry as a profession.

If we consider that the birth of a profession as a profession dates from the time of organization of the first institution conferring a distinctive degree, it will be found that the Ohio College of Dental Surgery was the mother of the profession in all that part of the country lying west of the Alleghany mountains.

Organized in Cincinnati in 1845, only four years after the establishment of the first dental college in the world (the Baltimore College of Dental Surgery) it became the pioneer dental school in the West; the center of dental influence in all that territory.

To the efforts of Dr. James Taylor may largely be ascribed the establishment of this school and he, with Jesse W. Cook and Melancthon Rogers, constituted its first resident teaching faculty.

For a record of the conditions which surrounded the birth of the profession and of this school in the early forties I shall quote largely from a "history of the Ohio College of Dental Surgery," published by Dr. George W. Watt, an alumnus and one of its early teachers, in 1879. He says the dentist at this period "was on the same platform with the traveling tinker, who, trudging the highways and byways, turned aside to mend the kettles and candlesticks at the adjacent farm houses; and the dentists of this description were such a decided improvement on the blacksmith, the butcher and the barber, if not the physician and surgeon, who hitherto had the care of the teeth, that the demand for their services increased, till their circuits became shorter, their movements slower, finally, in obedience to the law of supply

and demand, they gravitated to a central point, and a new thing under the sun was revealed in the shape of a resident dentist.

"The tinker developed into a traveling dentist, he to a resident dentist, he to a seeker, otherwise a dental student; he to an imparter, otherwise a dental teacher; he to a co-operator with other men of science; and, co-operation in the cultivation of science means a college; and, with dental science as the leading thought, we have a dental college; and all this in obedience to the law of supply and demand.



"An event closely connected with the founding of this school occurring within the writer's (Dr. Watt's) memory, this man relates to one who, in a certain sense, is 'the father of us all.' 'Determined to stand or fall with dental science, notwithstanding his medical education, in the peregrinations then necessary to such a career, weary, ill, and hungry, with a horse as hungry as himself, approached an Ohio village. He met there a young lawyer possessing both a heart and a soul, who invited him to his father's house, thus rendering it unnecessary for the traveler to reveal his penniless condition, and who secured for him a number of remunerating patients among his acquaintances. But the fools were

not all dead then, as we shall see. When this dentist was about to leave the place, a man for whom he had inserted an artificial tooth, got out a warrant for the arrest of the dentist, for obtaining money under false pretenses, claiming that the substitute was less presentable than the natural tooth of which he had been deprived. The young lawyer was still equal to the emergency and again sent the dentist to his father's house, keeping him wholly ignorant of the existence of the warrant, reporting to the constable that he had gone, as he truly had, but not far. Now if from any or all of these trying circumstances, this young dentist had become discouraged, and had abandoned the practice of dentistry, the history of the Ohio College of Dental Surgery might not have been written, for these incidents are from the life of one of its incorporators, its principal stockholder, the president of its board of trustees, its oldest teacher, our professional father, James Taylor.'

"When humanity is ready for a new discovery, or a new era is in progress, it makes its appearance, seeming not to emanate from the individual mind, as from the combined thought of the race. Dental colleges follow no new rule in regard to human progress; but the thought was ripe in the minds of those giving their entire professional attention to the mouth and its adjacent organs. This thought assumed practical shape first in the state of Maryland, resulting in the establishment of the Baltimore College of Dentistry. But the dentists of the West, though fewer in number, and more widely dispersed, were equally ripe for action; and this action promptly asserted itself in the organization of the Ohio College of Dental Surgery on the 21st day of January, in the year 1845."

The charter granted by the legislature of Ohio is entitled "An Act to authorize the establishment of a College of Dental Surgery."

Among the provisions in this charter, which may be generally interesting, I quote the following paragraphs:

And, provided, also, that no branches of medical science shall be taught except those necessary to dental surgery.

That said Board of Trustees shall have power, and are hereby authorized to confer the degree of Doctor of Dental Surgery, and grant diplomas for the same, under the seal of the corporation; provided that no diploma thus granted shall confer any privilege further than the practice of dental surgery.

In the spring of 1845, the trustees appointed by this act met and organized by the appointment of B. O. Aydelotte, M. D., D. S., president, and Israel M. Dodge, M. D., secretary, and thus organized the Ohio College of Dental Surgery by the creation of the following departments: Dental anatomy and physiolo-

ogy, of which Jesse W. Cook, M. D., D. D. S., was made professor; dental pathology and therapeutics, of which Melancthon Rogers, M. D., D. D. S., was appointed professor; practical dentistry and pharmacy, of which James Taylor M. D., D. D. S., was appointed professor. Jesse P. Judkins, M. D., was appointed demonstrator of anatomy and professor Taylor agreed, for the time, to discharge the duties of demonstrator of practical dentistry.

The faculty elected Professor Cook, dean, and he issued the first annual announcement, and the college session, for its first course of lectures, opened the first Monday of November, 1845, and closed on or about the 20th day of February, 1846, four young men receiving degrees, one of whom is still alive, Dr. B. A. Satterthwait of Lima, Ohio. President Aydelotte delivered the opening address, conferred the degrees, and, in behalf of the college, gave each graduate a copy of the "Holy Bible," a custom which was continued for many years. Professor Cook made the valedictory address to the graduates. And thus ended the first voyage of the Ohio college upon the sea of science.

For the second session the venerable Christian philosopher, Elijah Slack, D. D., LL.D., was appointed lecturer on chemistry; and, it is believed, delivered the first course of lectures on this science ever given to dental students.

"In 1847, Professor Cook resigned his chair, and the trustees filled it by electing J. F. Potter, M. D., and the faculty appointed Dr. William M. Hunter demonstrator of mechanical dentistry.

"In 1848, Professors Rogers and Potter resigned and George Mendenhall, M. D., was elected professor of pathology and therapeutics, and John T. Shotwell, M. D., professor of physiology and anatomy. The faculty appointed A. M. Leslie, D. D. S., demonstrator of mechanical dentistry and Charles H. Raymond, lecturer on chemistry.

"In the department of anatomy, Professor Shotwell was succeeded by Thomas Wood, M. D.; he by C. B. Chapman, M. D.; he by Charles Kearns, M. D.; he by William Clendenin, M. D. The character and standing of the professors elected to teach this science show the high estimate placed upon it by the trustees and stockholders of the college.

"In 1850, a professorship of mechanical dentistry was created, and A. M. Leslie, D. D. S., was elected to the new chair, which has since been held by John Allen, D. D. S.; H. R. Smith, D. D. S., M. D.; Joseph Richardson, M. D., D. D. S.; C. M. Wright, D. D. S.; J. A. Watling, D. D. S.; William Van Antwerp, D. D. S.; N. S. Hoff, D. D. S., and J. R. Clayton, D. D. S.

"In the department of chemistry, Dr. Raymond G. L. Van Emon, D. D. S., was appointed lecturer in 1851. And in 1853, George Watt, M. D., succeeded

him as lecturer, and he was in turn, succeeded by George M. Kellogg, M. D. In 1855, the science was regarded worthy of a professorship, a new chair was created, called 'chemistry and metallurgy,' and George Watt, M. D., D. D. S., was elected to fill it. The position has since been held by H. A. Smith, D. D. S.; S. P. Cutler, D. D. S.; J. G. Willis, M. D., D. D. S.; and J. S. Cassidy M. D., D. D. S.

"The chair of pathology, after the resignation of Professor Mendenhall, was filled by the election of J. B. James, M. D., and this position has been subsequently filled by George Watt, M. D.; Edward Rives, M. D.; F. Bruning, M. D.; A. O. Rawls, D. D. S., and C. M. Wright, A. M., D. D. S.

"In 1851, a chair of operative and mechanical dentistry was created, and John Allen, D. D. S., was elected to fill it. In 1853, this was divided, leaving the department of operative dentistry to Professor Allen, who, in 1854, resigned the chair, and was succeeded by Jonathan Taft, D. D. S., who occupied the place until March, 1878.

"A chair of clinical dentistry was established (at a date not recollected) and was filled at various times by Dr. W. T. Arrington, D. D. S.; J. A. Watling, D. D. S.; C. R. Butler, D. D. S.; William Taft, D. D. S., M. D.; H. M. Reid, D. D. S.; J. L. Taylor, D. D. S., and H. A. Smith, D. D. S.

"In 1850, the faculty adopted the following resolution, which was continued in force by the dental college association:—

Resolved, That a committee of two from the medical, and three from the dental, profession be selected annually to examine, in connection with the faculty, the candidates for graduation.

"After a fair experiment this was rescinded, in 1860, having been found unprofitable and tending to lower, rather than to elevate the character of the examinations, as it was found that a number of candidates received degrees who would have been rejected by a vote of the dental faculty alone.

"Previous to the session of 1851, the duties of the college were discharged in a building leased for the purpose. It had been mainly built by a distinguished educator, John L. Talbot, with special reference to the wants of this college. The lease for ten years included the privilege of purchase. By correspondence and personal solicitation, arrangements were made to buy the building; shares of stock, having been issued, were promptly taken by members of the profession, and a few others interested in dental education. It would be unjust should we fail to give Dr. Taylor due credit for this effort. Accordingly, in November, 1851, the college session was opened in a build-

ing owned by the profession and specially dedicated to the cause of dental education, which was another new thing under the sun.

"The stockholders held their first meeting in the lecture room of the college, February 19, 1852, with Dr. Charles Bonsall in the chair, and Dr. Thomas Wood as secretary.

"In 1854, the old building, purchased from Dr. Talbot, having been found inadequate to the growing wants of the college, the stockholders took steps toward the erection of an entirely new edifice. As the location, College st., between Sixth and Seventh streets, was central, it was decided to rebuild on the same ground. With marvelous energy and promptness the new building was erected and furnished in time for the opening of the ensuing course of lectures. This was the first building erected for the sole and special purpose of dental education.

"In 1865, a change in the charter and general management of the college occurred. One object of the change was to bring the institution more directly under the immediate supervision and control of the college association.

"A radical and advanced step in the cause of dental education was taken by the college association and board of trustees on the 5th of March, 1867. Its provision that there should be a division of the course into 'junior' and 'senior' studies; and its further requirement that 'members of the junior class will be required to pass an examination on the branches studied before entering the senior class,' were at this time probably new features in the dental collegiate study."

If we take up the history of the institution from the period described above, we find that for ten years the college struggled hard for existence, the graduates numbering seven in 1874. Dr. J. Taft was then dean and Dr. James Taylor emeritus professor of institutes of dental science. In 1878 a new regime was inaugurated with Dr. H. A. Smith as dean and Dr. J. S. Cassidy secretary, Dr. James Taylor resuming his chair in the faculty.

By arduous work the matriculates were brought up to the number of fifty and the graduates that year numbered twenty-four. The following year the matriculates numbered sixty-nine and the graduates thirty-one, that being the largest matriculation in the history of the school. Dr. George W. Keely, of Oxford, delivered his first course of lectures on "Causes and Management of Irregularities of the Teeth," which course was among the first ever given upon that subject. It should be remembered that the requirements for graduation in dentistry at that time prescribed attendance upon two sessions of about five

months each and reputable practitioners of dentistry of five years' experience, as well as graduates of medicine, were received into the senior class for graduation in one year. The system of granting honorary degrees was then in force in this and other dental schools.

The fees at that time in many of the dental and medical schools were placed upon a seventy-five dollar basis.

In 1881, the college and the profession were called upon to mourn the death of Dr. James Taylor, who had been its faithful teacher and officer for so many years. In 1884, the faculty was composed of Professors J. S. Cassidy, chemistry; H. A. Smith, operative dentistry; C. M. Wright, physiology; William Knight, anatomy, and Frank Bell, mechanical dentistry. These men have occupied the same chairs almost continuously to the present time; Professor Bell being succeeded by Dr. Grant Molyneaux in 1887. The deanship assumed by Professor H. A. Smith in 1878, has also continued unchanged to the present time, the school reaching its period of greatest usefulness and prosperity under his guidance.

For the session of 1885-6 the new rules of the National Association of Dental Faculties were put in force, eliminating the equivalency of one session credited to practitioners of five years' experience and requiring all students to attend two full courses for graduation; crediting, however, graduates of medicine with one session, as heretofore, and eliminating also the privilege of granting honorary degrees.

In 1888 the college became the dental department of the University of Cincinnati, assuming that name in addition to its old name, and its diplomas were so inscribed. The college retained its identity in every way and this condition satisfactorily continued until the session of 1906-7 when the arrangement was dissolved.

In 1901-2 the college recorded its greatest number of matriculates, 266, the graduates numbering eighty-nine. This was just previous to the increasing of the entrance requirements by the National Association of Dental Faculties to the completion of the second year of the high school.

In 1894, Dr. H. T. Smith became an officer of the faculty, assuming the secretaryship, which position he continues to hold at the present time. He took the adjunct professorship of operative dentistry the following year and the professorship of clinical dentistry in 1898, this being the first change in the faculty in nearly fifteen years.

In 1899, the name of Dr. T. I. Way was added to the list of instructors and, in 1906, Dr. F. Burger was made adjunct professor of prosthetic dentistry, succeeding Professor Molyneaux in that chair the following year.

The scope of the instruction now offered by the school can be judged by the following list of its departments and their teachers:

J. S. CASSIDY, A. M., M. D., D. D. S., Professor of Chemistry and Materia Medica.
H. A. SMITH, A. M., D. D. S., Dean; Professor of Dental Pathology and Therapeutics.

C. M. WRIGHT, A. M., D. D. S., Professor of Physiology and General Pathology.

WILLIAM KNIGHT, M. D., D. D. S., Professor of Anatomy and Oral Surgery.

H. T. SMITH, D. D. S., Secretary; Professor of Operative Dentistry and Orthodontia.

T. I. WAY, D. D. S., Professor of Dental Technics.

FRANK BURGER, D. D. S., Professor of Prosthetic Dentistry and Metallurgy.

SPECIAL LECTURERS.

C. I. KEELY, D. D. S.; L. E. CUSTER, B. S., D. D. S.; A. J. MARKLEY, M. D., D. D. S.; PAUL CASSIDY, A. B., D. D. S.; L. S. COLTER, M. D.

DEMONSTRATORS.

T. I. WAY, D. D. S.; FRANK BURGER, D. D. S.; HARRY MILLER, D. D. S.; VAN BROADUS DALTON, D. D. S.; M. M. MAUPIN, D. D. S.; DAVID STERN, B. S., D. D. S.; GOODRICH B. RHODES, A. B., M. D.; O. L. CAMERON, M. D.; A. E. OSMOND, M. D.; W. F. KNEMOELLER, D. D. S., Ph. G.; and J. H. HUSCHARDT, D. D. S.

The college has graduated in the sixty-three years of its existence 1,765 students. Its alumni are represented among the leading practitioners of nearly every country on the globe.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

FIRST PHILADELPHIA COLLEGE OF DENTAL SURGERY.

PHILADELPHIA, PA.

BY GEO. W. WARREN, A. M., D. D. S.

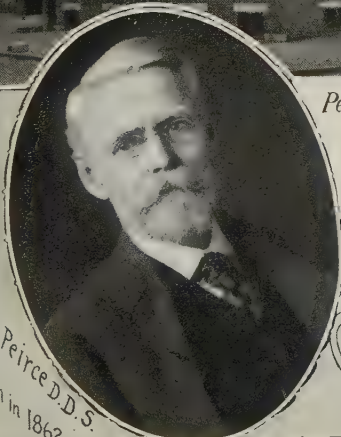
The Philadelphia College of Dental Surgery, the first of that name, was chartered in 1850, but five years prior to that time an attempt had been made to procure a special act of the legislature of the state of Pennsylvania to incorporate a dental college, which was unsuccessful. The charter obtained in 1850 was the result of the efforts of Hon. Jesse R. Burden, but the members of the Pennsylvania Association of Dental Surgeons, who had failed in their effort to obtain a charter in 1845, were not fully satisfied to have such a charter



*Elisha Townsend, MD, DDS.
Founder.*



*William F. Litch, MD, DDS.
Dean.*



*C.N. Peirce, D.D.S.
Dean in 1862.*

*Pennsylvania College
of
Dental Surgery
Philadelphia
Pa.*

*J.D. White
MD, DDS*



in the hands of Mr. Burden whom they did not know, and they, accordingly, made another effort to procure a charter, but they subsequently dropped the matter and entered into an agreement with Mr. Burden. The Philadelphia College of Dental Surgeons began its first session in November, 1852, with J. D. White, M. D., D. D. S., professor of anatomy and physiology; Eli Parry, M. D., D. D. S., professor of histology, materia medica and special therapeutics; Robert Arthur, D. D. S., professor of principles of dental surgery; Elisha Townsend, M. D., D. D. S., professor of operative dentistry and dean; T. L. Buckingham, M. D., professor of mechanical dentistry, and D. B. Whipple, M. D., demonstrator of surgical and mechanical dentistry.

This college lived only four years, during which time it graduated sixty-three students, as follows: Seven in 1853; nineteen in 1854; fifteen in 1855 and twenty-two in 1856. It also conferred twenty-two honorary degrees in 1853; seven in 1854; one in 1855 and two in 1856.

The honorary degree granted in 1855 was bestowed by the president upon a student whom the faculty considered as incompetent to obtain the degree and in 1856 the president also bestowed two honorary degrees in direct opposition to the expressed wishes of the faculty, whereupon the entire faculty withdrew from the school and the first Philadelphia College of Dental Surgery ceased to exist.

The retiring faculty of the school, with the exception of Dr. J. D. White, at once entered upon the task of organizing and establishing the Pennsylvania College of Dental Surgery, the first class of which institution assembled in November, 1856. The school was incorporated by a special act of the legislature, which was signed by Governor James Pollock, on April 3, 1856. The act reads as follows:

An Act to Incorporate the Pennsylvania College of Dental Surgery.

Section 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same, that Henry C. Carey, William Elder, Washington L. Atlee, Elisha Townsend, George Trueman, Benjamin Malone, Alfred Stille, Daniel Neall, Thomas Wood, William W. Fouche, John R. McCurdy and T. S. Arthur, and their associates shall be a body corporate with perpetual succession under the name of the Pennsylvania College of Dental Surgery, to be located in Philadelphia, and as such may sue and be sued, have a common seal and purchase and convey real and personal estate not exceeding in annual income \$2,000 beyond the building to be occupied by said college: Provided, That said corporators shall not at any time be more than fifteen nor less than ten without the vacancies being filled.

Section 2. That the said corporators shall have the power to make by-laws for their own government, and that of the faculty, not contrary to the laws of this State

or of the United States; to establish a college for lectureships, and to confer the degree of "Doctor of Dental Surgery" upon persons duly qualified to receive the same.

Section 3. That the corporators shall have the power to elect five or more professors, skilled in dentistry, to constitute the faculty of said college, who shall deliver the lectures and control the course of instruction therein; and no degree shall be conferred, whether honorary or upon the qualified students of the college, without the written request of said faculty.

RICHARDSON WRIGHT,
Speaker of the House of Representatives.

WILLIAM M. PIATT,
Speaker of the Senate.

Approved, the third day of April, Anno Domino, one thousand, eight hundred and fifty-six.

JAMES POLLOCK.

The board of corporators named in the act were Henry C. Carey, Thomas Wood, John R. McCurdy, who was of the firm that preceded the present S. S. White Dental Manufacturing Company, and also the editor of the "Daily News Letter"; T. S. Arthur, a brother of Professor Robert Arthur, layman; Drs. Elder, Atlee, Stille and Malone of the medical profession; Drs. Daniel Neall, W. W. Fouche, Elisha Townsend and George Trueman, dentists.

On April 6, 1856, they organized by electing Hon. Henry C. Carey, president, and Mr. Thomas Wood, secretary. Dr. Townsend and Dr. McCurdy retired. Mr. Arthur and Drs. Atlee, Malone and Trueman had been members of the Board of the Philadelphia college during its entire existence, they continued as members of its successor and remained active members of the board until removed by death.

The first faculty consisted of the following:

Elisha Townsend, D. D. S., M. D., Professor of operative dental surgery.
Ely Parry, D. D. S., M. D., Professor of chemistry, materia medica and therapeutics.
Robert Arthur, D. D. S., M. D., Professor of the principles of dental surgery.
J. F. B. Flagg, D. D. S., M. D., Professor of anatomy and physiology.
T. L. Buckingham, D. D. S., M. D., Professor of mechanical dentistry.

At the first meeting of this faculty, on April 23, 1856, Dr. Robert Arthur was chosen dean, and Dr. Louis Jack and D. William Calvery were appointed to the same positions they held in the old Philadelphia college, namely, demonstrators of operative dental surgery and mechanical dentistry.

About two months after the resignation of the faculty of the Philadelphia College of Dental Surgery, the organization of the new college had been completed with the same teachers, only one excepted. So that excepting the change in name and incorporators, the work of teaching went on without interruption

by the same faculty in 1856-7 that had contended for the honor of the dental degree in 1855-6.

In order to graduate, the candidate was required to have had at least two years of private instruction, exclusive of his two years' course at the college, one year's complete course in a reputable dental or medical college, or five years' practice entitled the matriculate to one year's credit. Clinical work in the college building was required of candidates for graduation, exhibiting the performance of the usual operations, and also prosthetic work in practical form, before submitting to and passing a final faculty examination.

The fees were \$115 for the course; matriculation fee (paid but once), \$5, and diploma fee \$30.

The session began on Monday, November 3, 1856. Thirty-three students matriculated for this session. The first commencement was held on February 26, 1857, with a graduating class of thirteen. The valedictory address, which Professor Townsend delivered, was his last public professional act, as his death occurred the next year—he had tendered his resignation soon after the class work was finished by reason of ill health. This was accepted. Dr. John H. McQuillen was elected to fill the vacancy.

Drs. Arthur and Parry resigned, Drs. William Calvert and J. Hayhurst were appointed to fill the vacancies. Dr. Buckingham was assigned to the chair of chemistry, materia medica and therapeutics, Dr. Calvert became professor and Dr. Thomas W. Walker demonstrator of mechanical dentistry. The fee for the annual course was established at \$100 including demonstrators' fees, a reduction of fifteen dollars. For this session of 1857-8, forty-eight students matriculated; of these fifteen graduated.

Professor J. F. B. Flagg established a "dental academy." The faculty feared the effect this might have upon the college and that Professor Flagg's interest as a college teacher might become effected and requested him to abandon his dental academy. Instead he resigned his chair.

Professor Hayhurst also resigned his chair, as did also Dr. Jack, as demonstrator. Dr. Walker, demonstrator of mechanical dentistry, died in July, 1858. Dr. C. Newlin Peirce, of Philadelphia, and J. L. Suesserott, of Chambersburg, Pa., entered the faculty. Professor McQuillen was transferred to the chair of anatomy and physiology. Dr. Peirce became professor of dental physiology and operative dentistry; Dr. Suesserott, professor of principles of dental surgery and therapeutics, and Professor Buckingham, professor of chemistry and metallurgy. Dr. D. H. Goodwillie and Dr. J. J. Griffith were appointed demonstrators of operative and mechanical dentistry, respectively.

Fifty-one students matriculated for the fourth session, 1859-60. Of these

twenty-one graduated February 28, 1860. During this session vulcanized rubber was introduced into the college as a base for artificial teeth.

The fifth session opened with sixty-three matriculates, of which thirty-six graduated.

On June 13, 1862, Professor Calvert resigned by reason of removal to California. Dr. E. Wildman succeeded to his chair, and Professor Peirce became dean.

In 1862, Professor Suesserott resigned, and was succeeded by Dr. George T. Barker, who had shortly before followed Dr. Goodwillie as demonstrator. This was not agreeable to Professor McQuillen and he immediately resigned. W. S. Forbes, M. D., was elected his successor. Dr. James Truman then took Dr. Barker's place as demonstrator of operative dentistry, and Dr. E. N. Bailey took the place of Dr. Griffith as demonstrator of mechanical dentistry. The honorary degree of D. D. S. was conferred upon Professor Forbes, and Dr. J. D. White was elected emeritus professor.

About this time the college encountered troubles which threatened its life. The faculty received notice from the owners of the building that they would need the space occupied by it to meet the wants of their growing business at the end of the school year.

A charter for a new dental college to be known as the Philadelphia Dental College had been obtained and the organization of this college had been effected under the direction of Dr. J. H. McQuillen. When Dr. McQuillen, then the editor of "Dental Cosmos," and the publishers of this journal refused further to issue the announcements of, or to advertise the Pennsylvania College of Dental Surgery, it looked as if there was trouble in store for the faculty of that college. To add to the discomfort the faculty was refused the further use of the journal's mailing list. The professors were, however, harmonious and determined not to succumb to the obstacles placed in their way. They secured a lease of new premises at the southeast corner of Tenth and Arch streets and fitted them up for college purposes. The postmasters of every county in the United States were written to for a list of dentists in their locality, and a new mailing list was thus obtained. In doing this the city directories of the larger cities were also available.

On June 18, 1864, Dr. Edward N. Bailey died and Dr. J. M. Barstow was appointed demonstrator of mechanical dentistry in his place. Professor Peirce resigned at the close of the session of 1864-5 and was succeeded by Dr. James Truman, Dr. E. T. Darby filling the place as demonstrator of operative dentistry thus vacated.

The faculty, in December, 1865, decided that dentists in practice prior to 1852, and who were operators with good reputations as such, might become candidates for the degree without attending the lectures, and issued the following announcement:

CANDIDATES FOR GRADUATION WHO HAVE NOT ATTENDED LECTURES.

Dentists who have been in continued practice since 1852 are eligible to be candidates for graduation without attendance on lectures. The candidate for graduation must present satisfactory evidence of his having been in practice for the allotted time, also of his good standing in the profession; he must prepare a thesis upon some subject connected with the theory or practice of dentistry. He must present specimens of his workmanship. He must undergo a satisfactory examination by the faculty, when, if qualified, he shall be recommended to the board of trustees and, if approved by them, shall receive the degree of Doctor of Dental Surgery.

Thirty-six availed themselves of this opportunity during the years this practice was continued: Dr. John B. Wheeler, of New York; A. Lawrence, of Massachusetts, and W. G. A. Bonwill, of Delaware, received the degree under this rule at the commencement on March 1, 1866. This rule was not advertised after the announcement for the session of 1869-70. Theodore F. Chupein, then of Charleston, S. C., but later of Philadelphia, in 1872, and W. T. Smith, of Maryland, were the last to receive degrees under this rule, in 1879. Such graduates were required to pay only the matriculation and diploma fees.

During the session of 1864-5, there were fifty-six matriculates, of whom twenty-nine graduated. At the commencement held in February 1865, the honorary degree was conferred upon Theodore S. Evans, of Paris, France; J. M. Barstow and Mahlon Kirk, of Philadelphia; Jesse C. Green, of West Chester, Pa., and J. D. Wingate, of Bellefonte, Ga.

Previous to 1866-7 all clinical work had been a gratuity to patients. The faculty decided that year to make a charge for the materials used in the mechanical clinic. There were 100 matriculates, twenty-six graduates in course and twenty-three who had been in practice prior to 1852.

In 1867 Dr. Henry Hartshorn became a member of the faculty, having the chair of physiology and hygiene assigned to him.

In 1870, Professor Hartshorn and Professor Forbes resigned. Dr. James Tyson and Dr. J. Ewing Mears succeeded them. Professor Mears instituted a surgical clinic in connection with his chair. This clinic was continued throughout his thirty years' service in this college.

Another matter of much interest to the dental profession was at this time

introduced when at a meeting of the governing board the following resolution was adopted:

Resolved, That the advancing spirit of the age and the just right of women require that they shall be admitted to medical and dental education, and that the faculty of this college be requested to admit women as matriculants to the college at as early a period as they may deem advisable.

In the session of 1872-3, several women entered. Their presence was objected to by other members of the class, and it was suggested that they be excluded from future classes. The board, after a careful hearing, referred the question to a committee. This committee reported March 31, 1873, that the act of matriculation was a contract between the school and the student, that while the student was under no obligation to attend a second years' course, the faculty must permit him to do so as long as he pays the fees and conducts himself properly; that the charter of the school does not prohibit the entrance of women; that while the faculty had the right to matriculate or to refuse to matriculate whom they chose, but having once matriculated a student and accepted the customary fees, it was obliged to receive this student for the completion of his course and to graduate him if otherwise found qualified.

A supplemental spring course was commenced in April, 1873, and continued until the last of June. Each member of the faculty delivered one lecture each week and the clinics were open during the session. Clinical lectures by men who had developed especial skill in some particular field and who were willing to give the students the benefit of their demonstrations, were introduced. Drs. A. L. Northrup, of New York City; C. A. Marvin, of Brooklyn; C. Palmer, of Ohio; E. T. Darby, Robert Huey and William H. Trueman, of Philadelphia, were appointed with this end in view.

In 1876, Professor Wildman died and Professor Truman resigned. Drs Charles J. Essig and Edwin T. Darby were their successors.

The matriculates for 1877-8 numbered 157. In this year the University of Pennsylvania, having decided to establish a department of dentistry, approached the college with a proposition for its transfer to the University. To carry out the scheme the unanimous vote of the faculty was needed, but as the question was only carried by a two-thirds vote of the faculty, the matter fell through. Near the end of the session, Professor Barker died. His chair remained vacant and his subjects were covered by other chairs.

At the close of the sessions of 1877-78, Drs. Essig, Tyson, and Darby resigned to accept positions in the projected dental department of the University of Pennsylvania. The faculty was then reorganized and Drs. C. N. Peirce,

Wilbur F. Litch and Henry C. Chapman were elected to fill the chairs of operative dentistry and dental pathology, prosthetic dentistry and *materia medica*, and physiology and general pathology, respectively.

A larger building was secured at the northwest corner of Twelfth and Filbert streets to better accommodate the growing wants of the college. A chemical laboratory properly equipped was here established; also a dissecting room. Dr. Percival E. Loder became the demonstrator of anatomy, and in conjunction with Professor Mears opened a dissecting room in the college building. This was the first dissecting room ever opened in a dental college. Dental students, heretofore, had to obtain their practical anatomical study outside of their own college building.

Drs. Robert Huey and F. M. Dixon, of Philadelphia, and J. N. Farrar of New York, became lecturers on operative dentistry. The length of the school year was increased from four to five months. By supplementing this with the spring course, the student was enabled, if he so chose, to spend nine months of each year in dental study and instruction. At this time an arrangement with the Jefferson Medical College was effected through which students could obtain sufficient credit to obtain the degree of M. D., as well as that of D. D. S., in three years.

Professor Buckingham died in 1883, Dr. Henry Leffmann was his successor. Professor Chapman resigned March 20, 1885, and Dr. Albert P. Brubaker was elected to the vacancy.

Growth of the classes demanded expansion of space in which to instruct them. To meet this requirement the northeast corner of Eleventh and Clinton streets was purchased by the board of corporators. Some of the buildings already on the property were torn down and additional structures were erected and the remaining part remodeled. The spring term of 1893 dedicated this permanent home to dental education. The number of students increased to such an extent that it became necessary to establish a graded course, each carrying on its own special work, and thus the capacity of the building was taxed to its utmost.

In 1898, the chairs of dental anatomy, dental histology and prosthetic technics; and of clinical dentistry and oral pathology were established. Dr. I. Norman Broomell, became professor of the first and Dr. George W. Warren of the latter. In 1899, Professor Mears tendered his resignation, and Dr. Percival E. Loder succeeded him. A new chair was also established with W. J. Roe, M. D., D. D. S., as professor of surgical pathology and oral surgery.

Upon the retirement of Dr. C. N. Peirce, in 1901, Dr. Warren assumed

his duties, the title of his chair being changed by the board of corporators to that of principles and practice of operative dentistry.

Dr. Henry Leffmann retired from active service at the same time and J. Bird Moyer, B. S., Ph. D., was elected to the chair of chemistry and metallurgy. In January, 1908, Dr. Percival Loder was removed by death, and Dr. Roe was elected to perform the duties pertaining to the chair of anatomy, his chair now being anatomy, and oral surgery.

This college is the third oldest now in existence and has graduated about 3,000 students.

The first board of corporators organized April 6, 1856, by electing Henry C. Carey president and Thomas Wood secretary. Mr. Carey continued to serve as president, taking a keen interest in the welfare of the college, until his death, which was announced at the meeting of the board February 24, 1880. He left to the college by his will securities to the value of \$1,000.

February 24, 1880, Samuel D. Gross, M. D., LL. D., the distinguished surgeon, was elected president of the board and continued to serve until his death in the latter part of 1884. December 2, 1884, S. W. Gross was elected his successor, continuing in office until his death, which was announced to the board May 13, 1889. On that day, I. Minis Hays, M. D., was elected president. Dr. Hays was first elected to the board on March 20, 1885.

Mr. Thomas Wood, the first secretary, resigned that office in 1860. He continued a member of the board, however, until his death, May 27, 1880. He was succeeded as secretary by Mr. Charles Hamilton, in 1860. Mr. Hamilton first interested himself in the college when the application for a charter was made to the legislature. He was elected to the board in 1857, and for many years was a constant visitor at the college clinics and took a keen interest in the students' work. He died in 1872, leaving a legacy to the college.

W. W. Fouché, D. D. S., was elected secretary, February 25, 1873. Dr. Fouché was a member of the original board, was one of Philadelphia's prominent and skillful dentists, and took an active part in the educational movement which led to the organization of the first dental college in Philadelphia. He resigned the office of secretary February 24, 1880, but continued an active member of the board until, feeling the burden of advancing years, he resigned February 23, 1886.

David Roberts, D. D. S., was elected secretary February 24, 1880. He was elected a member of the board February 23, 1875. Although he had been in practice several years before it was organized, he entered the first class of the Philadelphia College of Dental Surgery and was graduated from

that institution at its second commencement, February 28, 1854. He acted as secretary of the board until his death, in 1891. His successor, Joseph Pettit, M. D., D. D. S., was elected secretary February 26, 1892.

George R. Morehouse, M. D., became a member of the board in 1857, and was shortly afterwards elected treasurer, continuing in that office for more than half a century.

The Pennsylvania College of Dental Surgery has been most fortunate in having as presidents of its board of corporators four men of world wide distinction in their respective fields. The first, Hon. Henry C. Carey, it is said, was the greatest authority on political economy of his time. He was president of the board for twenty-four years. His successor was the "founder of American Surgery," Professor Samuel D. Gross, who was succeeded in four years by his worthy son Professor Samuel W. Gross, who occupied the position until his death; at which time (1889), the present incumbent, Dr. I. Minis Hays, no less distinguished in the scientific world both at home and abroad, was elected to the office. The fact that during all the long and successful existence of the Pennsylvania College of Dental Surgery only four men have occupied the honorable position of president of its controlling board, speaks much for the harmony and singleness of purpose of that body.

The faculty at present, 1908, is composed as follows:

C. N. PEIRCE, D. D. S., Emeritus Professor of Principles and Practice of Operative Dentistry.

HENRY LEFFMANN, A. M., M. D., D. D. S., Emeritus Professor of Chemistry.

WILBUR F. LITCH, M. D., D. D. S., Dean, Professor of Materia Medica, Therapeutics and Principles of Prosthetic Dentistry.

ALBERT P. BRUBAKER, M. D., D. D. S., Professor of Physiology, General Pathology and Bacteriology.

GEORGE W. WARREN, A. M., D. D. S., Secretary, Professor of Principles and Practice of Operative Dentistry.

W. J. ROE, M. D., D. D. S., Professor of Anatomy, Surgical Pathology and Oral Surgery.

J. BIRD MOYER, B. S., Ph. D., D. D. S., Professor of Chemistry and Metallurgy.

H. E. RADASCH, M. D., Adjunct Professor of Physiology.

WILLIAM H. TRUEMAN, D. D. S., Lecturer on Dental History.

V. H. JACKSON, M. D., D. D. S., New York City, Special Lecturer on Orthodontia.

INSTRUCTORS IN OPERATIVE DENTISTRY.

E. ROLAND HEARN, D. D. S., Chief Instructor.

J. T. YODER, D. D. S.; LOUIS BRITTON, D. D. S.; J. W. ADAMS, D. D. S.; GEORGE F. BONNICK, D. D. S.; WM. C. T. BAUERLE, D. D. S.; FRANK G. RITTER, D. D. S. (Extracting and Anæsthetics).

INSTRUCTORS IN PROSTHETIC DENTISTRY.

W. T. HERBST, D. D. S.; JUSTIN E. NYCE, D. D. S.; CLARENCE C. DOUGHERTY, D. D. S.; E. A. KRETSCHMAN, D. D. S.
H. H. SHEPLER, B. S., D. D. S., Instructor in Chemistry.
E. E. HUBER, D. D. S., Instructor in Metallurgy.
A. GRANT LODER, A. M., M. D., Instructor in Anatomy.
W. R. ROE, D. D. S., Instructor in Surgery and Bandaging.

SPECIAL.

WILLIAM B. WARREN, D. D. S., Instructor in Crown and Bridge Work.
H. L. CRAGIN, D. D. S., Instructor in Dental Ceramics.
F. P. RUTHERFORD, PH. G., D. D. S., Instructor in Bacteriology.
SAMUEL S. PECK, D. D. S., Instructor in Appliances for Cleft-Palate Deformities and Maxillary Fractures.
W. K. THORPE, D. D. S., Instructor in Operative Technics.
CHARLES L. MILLER, D. D. S., Instructor in Appliances for the Correction of Dental Irregularities.

CLINICAL ASSISTANTS.

ADOLPH G. DITTMAR, MILTON MUSGROVE, Chair of Anatomy.
HENRY H. FULLERTON, JESSIE F. KELLY, HARRY C. FALLON, IDA SINGER, Chair Oral Surgery.

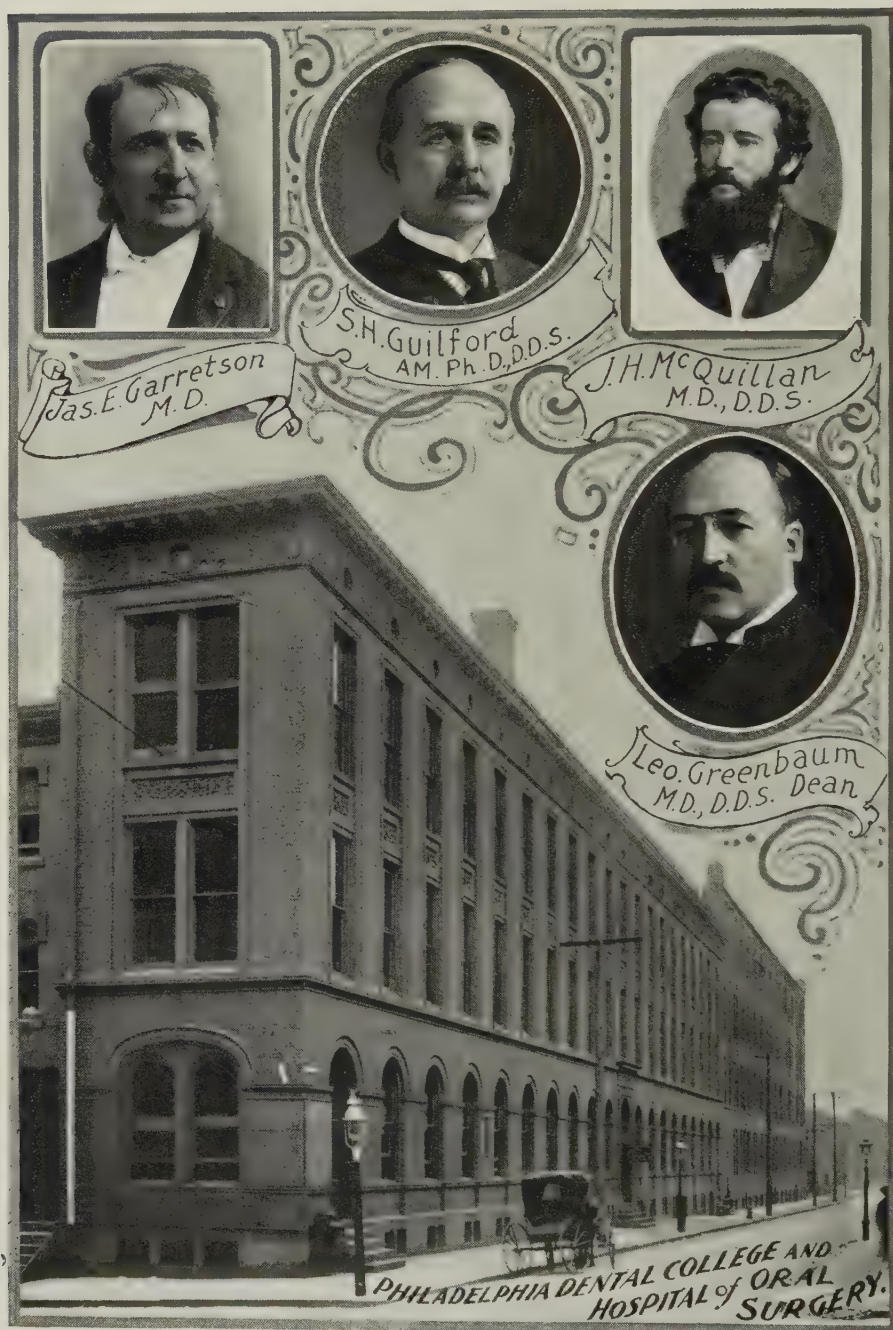
**PHILADELPHIA DENTAL COLLEGE AND HOSPITAL OF
ORAL SURGERY.**

PHILADELPHIA, PA.

BY L. GREENBAUM, D. D. S.

The first institution established in Pennsylvania for the imparting of knowledge in the science and art of dentistry was organized in 1852 under the title of the Philadelphia College of Dental Surgery. After a useful but short life of four years it yielded to the throes of internal dissention and ceased to exist.

In the fall of 1862, Dr. John H. McQuillen, holding the chair of operative dentistry and physiology in the Pennsylvania college, retired from the faculty, and in 1863, with the assistance of other members of the profession in the city and state, and after the expenditure of much effort and the overcoming of great opposition, for charters were not as readily obtained in those days as now, he succeeded in obtaining from the legislature of Pennsylvania a charter for a new institution under the name of the Philadelphia Dental College.



Jas. E. Garretson
M.D.

S. H. Guilford
AM. Ph. D., D.D.S.

J. H. McQuillan
M.D., D.D.S.

Leo Greenbaum
M.D., D.D.S. Dean

PHILADELPHIA DENTAL COLLEGE AND
HOSPITAL OF ORAL
SURGERY.

After securing a competent faculty and board of trustees the new institution opened its first term in November, 1863. Its faculty consisted of:

DR. J. H. MCQUILLEN, Professor of Anatomy, Physiology and Hygiene.

DR. J. FOSTER FLAGG, Professor of Institutes of Dentistry.

DR. C. A. KINGSBURY, Professor of Dental Physiology and Operative Dentistry.

DR. THOMAS WARDELL, Professor of Mechanical Dentistry and Metallurgy.

DR. HENRY MORTON, A. M., Professor of Chemistry.

Dr. McQuillen was elected dean and held that office continuously until his death. In 1865 Professors Kingsbury and Morton resigned and were succeeded by Drs. George W. Ellis and Albert R. Leeds, A. M. In 1866 Professor Ellis resigned and Professor Kingsbury resumed his former chair. In 1867 Professor Wardell resigned and Dr. D. D. Smith was elected to succeed him.

In the same year two new chairs were created, one of principles and practice of surgery and the other of anatomy. Dr. James E. Garretson was chosen the incumbent of the former and Dr. Harrison Allen of the latter.

In the following year, 1868, Professors Garretson and Leeds resigned. Dr. S. B. Howell was elected to succeed Professor Leeds.

In 1869 Professor Kingsbury resigned and was made emeritus professor, and Dr. T. C. Stellwagen was chosen as his successor. In 1870 Professor Flagg resigned and his chair was divided among the other professors.

Thus far some change had taken place in the personnel of the faculty each year but one. During the succeeding eight years no change occurred, but in 1878 Professor Garretson resumed his chair of Anatomy and Surgery, and Dr. Henry I. Dorr was made adjunct professor of practical dentistry.

In 1879 the chair of dental pathology and therapeutics was established and Professor Flagg was chosen to fill it. Owing to the lamented death of Professor McQuillen during this year, some changes in the chairs were made necessary. Professor Stellwagen succeeded Professor McQuillen in the chair of physiology and his former chair of operative dentistry was united to that of mechanical dentistry. At the same time a new chair of clinical dentistry was established and Professor H. I. Dorr was chosen to fill it.

In 1881 Professor Smith resigned and Dr. S. H. Guilford was elected incumbent of the chair of operative and prosthetic dentistry.

In 1889 Professor Dorr's chair was changed to that of practical dentistry, anaesthesia and anaesthetics.

From then until the death of Professor Garretson in October, 1895—a period of fourteen years—no changes occurred, but after his death Dr. H. C. Boenning was elected to the chair of anatomy and surgery, and Dr. M. H.

Cryer, for many years the assistant of Professor Garretson, was chosen adjunct professor of oral surgery.

In January, 1896, Professor S. H. Guilford was elected dean of the faculty.

In the spring of the same year Professors Dorr and Flagg resigned, owing to ill health. Dr. L. Greenbaum was thereupon chosen to succeed Professor Dorr and the chair changed to that of materia medica, anaesthesia and odontotechny. Dr. H. H. Burchard was chosen to fill the place of Dr. Flagg and made special lecturer on dental pathology and therapeutics.

In October, 1896, Dr. Cryer resigned to accept a position in the dental department of the University of Pennsylvania.

Few changes have occurred in the deanship of the institution. Professor McQuillen held that position from the establishment of the institution until his death in 1879. He was succeeded by Professor Smith, who held the office for two years. Professor Garretson assumed the office in 1881 and retained it until his death in 1895, after which Professor Guilford was elected to the position. In 1905 Dr. Leo Greenbaum was elected assistant dean. In June, 1906, Dr. Guilford resigned the office of dean and Dr. Greenbaum was elected to that position. In June, 1908, Dr. Greenbaum resigned the office and Dr. Guilford was re-elected dean.

The college has experienced few changes in the presidency of the board of trustees. The first incumbent was Rev. Richard Newton, D. D. At his death he was succeeded by the Hon. James Pollock, LL.D., ex-governor of Pennsylvania, who retained the office during the remainder of his life. General James A. Beaver, LL.D., ex-governor of Pennsylvania, was elected to the office after the death of Mr. Pollock. The federation with Temple University, in the spring of 1907, caused a change in the board of trustees and Russell H. Conwell was elected to the presidency.

At the time of the incorporation of the Philadelphia Dental College there were but three other dental schools in the country—one in Cincinnati, one in Baltimore and one in Philadelphia, with a combined attendance of less than one hundred pupils. Today there are in the United States more than fifty institutions in which dentistry is taught regularly, with a total yearly attendance of between four and five thousand students.

In the forty-one years of its existence the Philadelphia Dental College has graduated no less than 3,000 students. Along with other schools it has advanced from a two years' course of four months each to a three years' course of eight months, with supplemental spring and fall courses covering two months more. From an annual curriculum that required but thirty-four lec-

tures from each professor, it has developed until more than one hundred didactic lectures are given annually by the incumbent of each chair. In addition to this the clinical facilities have been enlarged year by year, giving to the students opportunities for the attainment of manual dexterity undreamed of years ago. One of the most prominent advances in recent years has been the establishment of technic courses in the freshman and junior years, cultivating not only the hand, but the eye and brain, as well as adding immensely to the symmetrical development of the pupil.

The Philadelphia Dental College was the first to introduce into its curriculum a course in oral surgery, and the first also to establish a hospital for the treatment of diseases of the oral cavity. The late Professor Garretson was the first to make a special study of such diseases and to constitute their consideration a part of the dental curriculum. With him the trained hand of the dentist in conjunction with the medically educated mind, made possible operations never before attempted.

The Philadelphia Dental College in its many years of existence has lost but five of its professors by death, but of those who have thus been removed three were conspicuous lights with reputations that were world-wide. All three were men of indomitable energy, wise judgment, greatness of heart and nobleness of character. Each was a master in the art of teaching. Two of these men at the time of death occupied the office of dean of the college and the most distinguished member of the faculty.

Dr. McQuillen was the founder of the school. He labored unceasingly for its proper establishment and then, through all the remaining years of his life, faithfully devoted himself to its development. Practice, comfort, health and finally life were sacrificed in order that the school which he loved might become a temple of knowledge worthy of the respect of all men.

Dr. Garretson was as ambitious as his predecessor for the advancement of the institution with which he was connected and for the true elevation of the profession which he loved. He was a man among men, capable of inspiring in others the confidence he felt in himself, and by his council and acts and teachings stimulated those under his care to the attainment of all that is noblest and best in life.

Dr. Flagg, who was connected with the school from its organization in 1863 until his death in 1902, was a teacher of rare magnetism and power. His investigations and experiments with plastic fillings and his various writings upon dental subjects caused him to be as well known abroad as at home.

This brief record would be incomplete without some reference to Professor

C. A. Kingsbury, who ably seconded the effort of Professor McQuillen in the establishment of the Philadelphia Dental College and was a member of its first faculty. He served the institution actively for six years and then continued in the honorary position of "emeritus" until his death in September, 1891. He proved himself a competent and faithful teacher, and his love for the institution and devotion to its interests were manifested in a multitude of ways.

During its existence two changes of location have been made necessary by the growth of the college. Upon its establishment it was located at the north-west corner of Tenth and Arch streets. There it remained until 1887, when it removed to a new and larger building on Cherry street below Eighteenth. Outgrowing these quarters in the course of eight years, it was decided to purchase ground in a new locality and erect a large and commodious building adapted solely to its own educational purposes. In 1896 a suitable location was found at Eighteenth, Buttonwood and Hamilton streets and, after preparation of satisfactory plans, ground was broken and the erection of the building was begun.

The corner stone was laid with Masonic ceremonies January 13, 1897, and the structure completed in August of that year. The building was opened for the fall term on September 1, 1897, and formally dedicated on October 4.

In honor of its founder the hospital has been named the Garretson hospital. It occupies a large portion of the first floor of the new building, and consists of a public ward with seven beds and a private ward with two beds. There are also a nurses' room, kitchen, beautifully finished bathrooms and etherization and recovery rooms.

Recognizing the advantage of the university connection, the board of trustees and the faculty of the Philadelphia Dental College entered into negotiations in the spring of 1907 with Temple College for the purpose of affiliation with the institution.

Temple College is a young and vigorous university established by Dr. Russell H. Conwell for the purpose of advancing education and helping worthy men and women. It offers over fifty different courses of study including theology, law, medicine, pharmacy, liberal arts and sciences and preparatory courses.

The federation of the Philadelphia Dental College with Temple College made no material change in the general regulations or system of instruction and did not change the name of the dental school. The ideas of the new administration are to bring the dental college into the university grade of college classification and put it into close alliance with the medical school.

enlarging the opportunities of the dental students in medical or surgical studies.

The new board of trustees of the dental college has no other purpose than to aid in a great benevolent purpose for the good of mankind. It is the intention to open to a large class of men of high character, good education and clear minds the opportunity to become dentists of the first rank.

The faculty is now, 1908, constituted as follows:

S. H. GUILFORD, A. M., D. D. S., PH. D., Professor of Operative and Prosthetic Dentistry and Orthodontia, Dean.

HENRY H. BOOM, M. D., Professor of Chemistry, Physics and Metallurgy.

OTTO E. INGLIS, D. D. S., Professor of Dental Pathology, Therapeutics and Materia Medica.

W. WAYNE BABCOCK, M. A., M. D., Professor of Anatomy and Surgery, Surgeon of Oral Clinic.

HENRY F. SLIFER, M. D., Professor of Physiology.

THOS. E. WEEKS, D. D. S., Professor of Crown and Bridge Work, Operative Technics and Dental Anatomy.

JOHN B. ROXBY, M. D., Professor of Practical Anatomy.

ALBERT ROBIN, M. D., Professor of Bacteriology and Pathology.

H. AUGUSTUS BACON, M. D., PH. G., Adjunct Professor of Anesthetics.

CLARENCE P. FRANKLIN, M. D., Adjunct Professor of Histology and Dental Hygiene.

R. F. MILLER, D. D. S., Lecturer on Porcelain Work.

HERBERT L. WHEELER, D. D. S., Lecturer on Dental Ethics.

CHARLES McMANUS, D. D. S., Lecturer on Dental History.

J. HOWARD RHODES, Lecturer on Dental Jurisprudence.

WM. A. STEEL, M. D., Lecturer on Minor Surgery as related to Dentistry.

THOS. E. WEEKS, D. D. S., General Superintendent of Infirmary and Prosthetic Laboratories.

R. F. MILLER, D. D. S., Demonstrator of Porcelain and Inlay Work.

SILAS W. WILLIAMS, D. D. S., Demonstrator of Operative Dentistry.

CHAS. F. WILBUR, D. D. S., Demonstrator of Prosthetic Technics.

ALBERT G. BRADBURN, D. D. S., Demonstrator of Orthodontia and Crown and Bridge Work.

THOMAS H. BUCKINGHAM, D. D. S., Demonstrator of Prosthetic Dentistry.

HENRY B. NONES, D. D. S., Demonstrator of Prosthetic Work.

P. H. VAN DERVOORT, D. D. S., Demonstrator of Crown and Bridge Work.

BENONI C. DUPLAINE, D. D. S., Demonstrator of Operative Dentistry.

ALFRED M. HAAS, D. D. S., Demonstrator of Crown and Bridge Work and Operative Technics.

D. T. FORDYCE, D. D. S., Demonstrator of Operative Dentistry.

MICHAEL F. QUINN, D. D. S., Demonstrator of Operative Technics.

MUGVUR HAGOPIAN, PH. G., D. D. S., Assistant Demonstrator of Histology and Bacteriology.

C. L. HENDERSON, Assistant Demonstrator in Chemical Laboratory.

CARLTON N. RUSSELL, D. D. S., M. D., Demonstrator of Oral Surgery.

NEW YORK COLLEGE OF DENTISTRY..

NEW YORK CITY.

BY FANEUIL D. WEISSE, M. D.

During 1864 certain members of the dental profession of the city of New York agitated the question as to the establishment of a dental college in New York City, which culminated in the presentation of a bill to the Legislature, at the session of 1865, for the incorporation of the New York College of Dentistry. The Act of Incorporation was passed March 31, 1865 (Laws of 1865, Chapter 264), with the following first Board of Trustees and Directors: Mr. McNamara Walsh; Rev. R. R. Booth; Dr. W. H. Allen; Dr. C. E. Francis; Dr. Geo. E. Hawes; Dr. Arnold C. Hawes; Dr. E. A. Mills; Dr. G. E. Roy; Dr. C. A. Marvin; Dr. W. B. Roberts.

A provision of the Act of Incorporation is that "The professors of said college, while professors therein, shall be members of the board of trustees and directors." This provision has been, in the history of the college, *the pillar of strength and perpetuity of the institution.*

The Act of Incorporation was amended April 3, 1867 (Laws of 1867, Chapter 243), as follows: "The Board of Trustees of the New York College of Dentistry may confer the honorary degree of Fellow of the College of Dentistry (F. C. D.) upon such persons as have made, or shall have made, valuable contributions to the science of dentistry, upon the recommendation of the Board of Professors of said College with the consent of the Regents of the University."

From 1865 to 1908 there have been sixty-six incumbent, non-professorial Trustees and Directors.

The Presidents of the board of trustees and directors have been: Eleazar Parmly, M. D., D. D. S. 1866 to 1869 (resigned); Stephen A. Main, D. D. S., 1869 to 1875 (resigned); William H. Allen, D. D. S., 1875 to 1882 (deceased); Mr. McNamara Walsh, 1882 to 1890 (deceased); Hon. Hampden Robb, Esq., 1891 to 1894 (resigned); F. F. Vanderveer, Esq., 1895 to 1896 (resigned); George Alexander, D. D., 1896 to date.

At a meeting of the board of trustees and directors, held September 30, 1865, by-laws were adopted (Sec. 5 providing that professors should hold their positions for one year only) and a faculty was elected for the year 1865-66, as follows: Dr. Norman W. Kingsley; Faneuil D. Weisse, M. D.; Dr. William H. Atkinson; Dr. William H. Allen; R. King Browne, M. D.; Dr. Charles Butler (Cincinnati); William H. Dwinnelle, M. D., D. D. S.; and Joseph



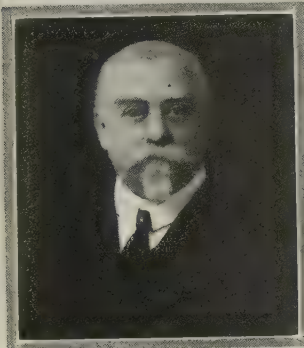
FRANK ABBOTT, M. D.
DEAN. (DECEASED)



ALEXANDER W. STEIN, M. D.
(DECEASED)



J. BOND LITTIG, D. D. S.
(DECEASED)



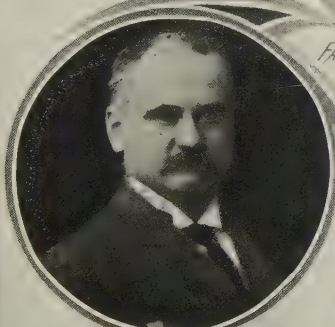
FRANCIS LE ROY SITTENLEE, M. D., PH. D.



FANEUIL D. WEISS, M. D.
DEAN.



J. BETHUNE STEIN, M. D.



ALFRED R. STARR, M. D., D. D. S.



ELLISON HILLYER, D. D. S.

New York College of Dentistry
New York City

Smith Dodge, Jr., M. D., D. D. S. This faculty did not fulfill the duties thereof, during their year of tenure, but participated with the board of trustees and directors in the discussions as to the organization of the college. At the meeting of January 25, 1866, Eleazar Parmly, M. D., D. D. S.,—the Nestor of the dental profession of that day,—was elected a trustee and director. At the meeting of February 27, 1866, it was unanimously resolved "That the members of the dental profession of the city be requested to meet, informally, with the board of trustees and directors, at the house of Dr. George E. Hawes, for the purpose of taking into consideration the interests and wishes of the dental profession in connection with the college."

This meeting was held on March 28, the attendance including a full representation of the leading members of the profession of the city, and after an extended consideration of plans for the future of the college a "Committee of Conference" was appointed, by the representatives of the dental profession, to present a "Plan of Organization" embodying the views expressed at this meeting by the profession. At the meeting of April 17, 1866, the board of trustees and directors received and considered a "plan of organization" presented by said "committee of conference." At the meeting of April 21, 1866, a "plan of organization" presented by Professor Faneuil D. Weisse, M. D., April 10, 1866, was adopted by the board of trustees and directors.

At the meeting of May 1, 1866, a second faculty was elected to serve for 1866-67. During the summer of 1866 rooms were obtained for the occupancy of the college, in a business building, at the corner of 22d Street and Fifth Avenue.

The plan for the conduct of the college work having been completed, the first session was opened, November 5, 1866, with thirty-one students, along the lines of Prof. Weisse's "Plan of Organization," with the following faculty members: Eleazar Parmly, M. D., D. D. S., Emeritus Professor of the Institutes of Dentistry; William H. Dwinnelle, M. D., D. D. S., Professor of Dental Science and Operative Dentistry; Dr. Norman W. Kingsley, Professor of Dental Art and Mechanism; J. Smith Dodge, Jr., M. D., D. D. S., Professor of Dental Pathology and Therapeutics; Faneuil D. Weisse, M. D., Professor of General and Descriptive Anatomy; Rufus King Browne, M. D., Professor of Theoretical and Experimental Physiology; Charles A. Seely, A. M., M. D., Professor of Chemistry and Metallurgy. The demonstrators were: D. H. Goodwillie, M. D., D. D. S.; Dr. R. M. Streeter; and Alexander W. Stein, M. D. A board of eighteen clinical lecturers was appointed, with Dr. Frank Abbott as secretary.

The session closed March 18, 1867, with nine graduates—who were eligible, under a provision of the year of eight years' practice, to take the graduation examinations and degree.

The annual election of professors in 1867 and 1868 effected professorial changes as follows: William H. Dwinnelle, M. D., D. D. S., Professor of Dental Histology, 1867 to 1868; Edwin J. Dunning, D. D. S., Professor of Operative Dentistry, 1867-68; P. H. Van Der Weyde, M. D., Professor of Chemistry and Metallurgy, 1867-69; Samuel R. Percy, M. D., Professor of Dental Pathology and Therapeutics, 1868-69; Alexander W. Stein, M. D., Professor of Physiology and Microscopic Anatomy, 1868-69; Dr. Frank Abbott, Professor of Operative Dentistry, 1868-69.

On April 13, 1869, the board of trustees and directors elected the officers of the board and the faculty for 1869-70; Dr. Stephen A. Main as president of the board; and as members of the faculty, Faneuil D. Weisse, M. D., Dr. Frank Abbott, M. D., Alexander W. Stein, M. D., and F. LeRoy Satterlee, M. D.—Dr. Norman W. Kingsley, who had acted as dean up to this time, was not re-elected.

It developed at this time that some party or parties had deposited bonds with the Attorney General of the State of New York, in order that an action should be commenced by the Attorney General, in the name of the people of the State of New York against the New York College of Dentistry, "demanding from the Supreme Court a judgment declaring the charter of the college vacated and annulled, because of violations of charter and that a receiver be appointed of all the chattels, goods and property of the defendant, and that an injunction be issued from the court restraining and enjoining the defendants, their agents and officers from managing or conducting said college under the Act of the Legislature, or from doing any business connected with said college or otherwise, besides costs of action."

The deposit of bonds with the Attorney General rendered it obligatory upon him to commence an action against the college, thereby imposing upon the college authorities to defend the case. The papers in this action were served upon the board of trustees and directors at their meeting of April 13, 1869, requiring the board to show cause why an injunction should not issue. On Friday, April 16, 1869, the Attorney General of the State appeared by counsel, appointed by him in New York city, and the college was represented by her counsel, Mr. McNamara Walsh, before Judge Cardozo, after which Judge Cardozo took the papers in the case to give his decision later.

Pending the decision of Judge Cardozo the conduct of the college was at a

stand-still until the following November, 1869, he having withheld his decision. The time for opening the regular college session had passed and the undergraduates of the previous year were prevented from continuing their curriculum. Finally, early in November—at the instigation of Professor Faneuil D. Weisse, M. D.—as no meeting of the board of trustees and directors could be held—he, with President Stephen A. Main, D. D. S., and Professor Frank Abbott, M. D., went to the attorney-general's office, in Albany, and laid before the deputy attorney-general, the motives back of the instigation of the suit, together with Judge Cardozo's withholding his decision on the issue of the injunction; further stating to him, that since April, 1869, the college authorities had been under continuous expense, without being able to conduct the business of the institution, or to fulfill their obligations to the undergraduate class of 1868-69.

After the hearing of these members of the committee the deputy attorney-general said: that he regarded the case as one of unwarranted persecution; that he would go to New York City the next day and appear before Judge Cardozo of the Supreme Court and officially withdraw the case from his hands; and that he would withdraw action against the college. On the following day the Deputy Attorney General fulfilled his promise.

A meeting of the board of trustees and directors was called for November 10th, 1869, when new by-laws were adopted, and the incumbent professors who were elected in April, 1869—Professors Weisse, Abbott, Stein and Satterlee—were reaffirmed in their positions under the new by-laws, with this difference that under the new by-laws they were elected in perpetuity and not for a term of one year, as under the previous by-laws adopted in 1865. On the 15th of November the session of 1869-70 was opened.

From 1869-95 the college maintained an unbroken career of progressive advance of educational standards.

From 1865-95 the college changed its location four times; first from rooms at the corner of 22d Street and Fifth Avenue to floors at the corner of 23d Street and Sixth Avenue; from there to floors at the corner of 21st Street and Broadway; then to floors at the corner of 23d Street and Second Avenue; and finally in 1891 to its present location, the six story building (50x100 feet), 205-207 East 23d Street—occupying the entire premises.

At the close of the session of 1894-95 Professor Frank Abbott, M. D., demanded of the faculty, for his son, Frank Abbott, Jr., M. D., that a Professorship of Pathology and Bacteriology be established and that he should assume the duties of Dean under his direction. To these propositions the other mem-

bers of the faculty could not accede. Upon the declination by his faculty colleagues to carry out his wishes, he, acting as incumbent vice-president of the board of trustees and directors, under a forced interpretation of a by-law, deliberately took every step, he officially could, to embarrass the carrying forward of the business of the college, and ultimately, October 31st, 1895, he with four of the trustees and directors whom he had induced to join him, petitioned the regents of the University of the State of New York, to withdraw the existing Act of Incorporation from the legislature under which the college was chartered and substitute therefore a charter to be issued by the regents of the University of the State of New York, which would deprive the professors from being members of the board of trustees and directors.

The fifteen other members of the board of trustees and directors, including the incumbent professors, united to defeat this action of Professor Frank Abbott, M. D., holding that their management of the college, since 1869, had been in conformity with the Act of Incorporation and the statutes of the state and that they had conducted the business of the college along conscientious and honorable lines.

The trustees were required to appear before a committee of the regents, in Albany, January 3, 1896, to show cause why the Act of Incorporation from the legislature of the college should not be withdrawn by the regents and a charter from the regents be issued to the college. The board of trustees and directors responded to the call by a full representation of fifteen of the twenty members, when both arguments, for, by Dr. Abbott's counsel, and against, by the counsel of the board, were heard by the committee of the regents.

After the hearing of the above arguments and also a financial report and full statement of the conduct of the institution from 1865-95—compiled by Professor Faneuil D. Weisse, M. D.—the committee of the regents exonerated the trustees and directors, including the professors, from having committed any irregularities under their Act of Incorporation. They, the regents, however, still thought, that it would be advisable for the professors to be withdrawn from the board of trustees and directors, and that this would be effected by the trustees and directors accepting a charter from the regents in exchange for their Act of Incorporation from the legislature. Acting on this the regents of the University of the State of New York issued a charter to the New York College of Dentistry, of date of March 19, 1896.

The question of this exchange remained under consideration between the regents and the trustees and directors of the college from March, 1896, until

February, 1897, when the regents voluntarily withdrew the regents' charter they had issued.

Since 1865 there have been nineteen incumbent professors—nine of them served their terms of service prior to 1869.

Of the incumbent professors since 1865 the length of service of five of them is remarkable: Prof. Faneuil D. Weisse, M. D., 1865 to date; Professor Frank Abbott, M. D., 1868-97 (deceased)—he had been a clinical lecturer from 1866; Professor Alexander W. Stein, 1868-96 (resigned because of failing health)—he had been demonstrator of anatomy from 1866; Professor F. LeRoy Satterlee, M. D., Ph. D., 1869, to date; Professor J. Bond Littig, D. D. S., 1877-1907 (deceased)—he had been connected with the college from 1869.

From 1868-77, four faculty members acted as one man; 1877-95, five stood as one. This unity and longevity of the professors as such and especially as members of the board of trustees and directors, by the Act of Incorporation, proved as before stated, "*the pillar of strength and perpetuity of the institution.*" Their continuity of service and their unanimity account for the stability of the institution through the years. It must be said here, that the non-professorial trustees and directors always recognized this faculty strength of years of experience by always seconding the faculty in whatever they suggested to be done.

Since 1869, prior to the election of Professor J. Bond Littig, D. D. S., to the chair of Mechanical Dentistry in 1877, C. A. Woodward, D. D. S., occupied the chair from 1869-73, and C. A. Marvin, D. D. S., filled the chair from 1873-77.

J. Bethune Stein, M. D., succeeded his father in 1896 to date. Alfred R. Starr, M. D., D. D. S.—who had been Prof. Abbott's assistant for eleven years—succeeded him in 1897 to date. Ellison Hillyer, D. D. S.—who had been Prof. Littig's assistant for thirteen years—succeeded him in 1907.

The Deans of the faculty have been: Professor Norman W. Kingsley, D. D. S., 1865-69; Professor Frank Abbott, M. D., 1869-1897; Professor Faneuil D. Weisse, M. D., 1897 to date.

From 1866-91 a two year course to the degree was required, and since 1891 a three year course has existed.

The length of the college session from 1865-66 to 1895-96 was five months; from 1896-97 to 1904-05 it was seven and a half months; since 1905-06 it has been eight months.

Up to the session of 1903-04, inclusive, the didactic instruction by lectures was given to the entire student body—first, second and third-year class-men

attending the same lectures for the three collegiate years. In 1904-05 a graded course of lectures for first-year class-men was established, attendance upon which was optional to second-year and third-year classmen. The second-year and third-year class-men continued attending the same lectures during their second and third year. The latter feature was imperative in order that students might be better prepared for the taking of the license examinations of the State Board of Dental Examiners (these examinations commenced in 1895) than they would be were the curriculum of the second and third year sessions divided into two graded courses.

The curriculum has been an evolutionary one. The methods of fulfilling it having been governed by the space available in the college premises; but, the trend of the work maintained through the years is embodied in the opening paragraph of the annual announcements: "The purpose of the institution is to educate men to practice dental surgery as a *specialty of medicine*, therefore, the curriculum includes the fundamental departments of medicine with operative dental surgery and oral prosthetics. The lectures on the fundamental departments of medicine are *specially directed to the needs of the dental surgeon*."

From 1866-91 the college premises only admitted of educational work by didactic lectures, clinics and infirmary practice. In 1891, when the college moved to its present building, the faculty were enabled to progressively fit up laboratories for practical work—practical chemistry and normal histology were the first opened. In 1894 additional laboratories were opened for the conduct of graded "Practical Classes"—for first-year, second-year and third-year class-men—to afford opportunities of personal work and direct demonstrations of every feature of the technic of operative dental surgery and oral prosthetics. The work of the "Practical Classes" and the plant of the laboratories have been perfected and added to from year to year, until now no less than 27 classes—including the original practical chemistry and normal histology—with 177 class sessions are conducted, affording 2,550 hours of practical work and demonstration to the students during each lecture session. The several classes take from five to eighty men for varying periods from a week to the entire session, according to the work dealt with. At present this system of "Practical Class" work covers the practical field of every department of the curriculum—dental and medical.

The "Plan of Organization" submitted by the "Committee of Conference" from the dental profession of New York in 1866, had, as its principal feature for the education of students in practical dental surgery and oral prosthetics, that members of the profession were to volunteer their services to give clinics

at the chair and in the laboratory. Respecting their wishes the "Plan of Organization" adopted in 1866, embodied this feature, and the board of trustees and directors for several years, appointed a "Board of Clinical Lecturers" as a part of the teaching body. Experience proved, however, at that time and subsequently, when it was taken up again, that this method of education, is of no advantage to the student body.

Weekly section clinics—to a limited number of students—have been and are conducted by the Professors of Dental Surgery, Oral Prosthetics and Oral Surgery.

The lecture room oral surgery clinic to the student body was established as early as 1867 and has been continued ever since. During later years the work increased so much that in 1906 a clinic room was fitted up and a daily clinic established. Today every phase of injury and disease of the buccal parietes presents—sent by the hospitals and dispensaries of Greater New York. During the past year 168 fractures of the inferior maxilla were treated—it is safe to say that since 1867 over 1,500 fractures of the inferior maxilla have been treated. Where operations are required patients are returned to the hospitals, where the third-year class-men go to witness them.

The conduct of the infirmary has been along the lines of other dental institutions, with the cardinal differences that we have maintained a special examination and financial department of the infirmary, where patients are examined as to the work required, estimates made as to the cost of the same and *fees received*. Furthermore, the faculty have, since 1869, held, that the earlier the student is brought to the inspection of the human mouth and thereafter kept continuously at it, the better; therefore, our first-year class-men have always been demonstrated to as to the cleaning of teeth and have practiced the same for the infirmary patients.

From 1886-94 students who applied for their first registration, who did not hold a diploma from a public school or credentials from a higher grade institution, were required to submit to an examination, conducted by the Dean, as to their proficiency in public school subjects.

In the spring of 1894 the board of trustees and directors received from the regents of the University of the State of New York a communication to the effect that, they would not consent, from that date, to the conferring of the degree of D. D. S. upon any graduate who did not hold the academic diploma of the State of New York, or credentials of a preliminary education equivalent thereto.

After a conference of Professor Faneuil D. Weisse, M. D.—appointed, with

power to act, by the board of trustees and directors—with the regents' office, the New York College of Dentistry accepted the establishing of definite preliminary educational requirements—she was in this respect the first dental institution of the country to do so. It was decided to enter upon an annual progressively rising scale of preliminary educational requirements—at this time the regents promulgated the "Dental Student Certificate" to be required to be held by students. To obtain the "Dental Student Certificate," first matriculates of 1894-95 were to be required to have a preliminary education the equivalent of that required for a "Medical Student Certificate" of that year; first matriculates of 1895-96 the equivalent of twelve academic counts; first matriculates of 1896-97, the equivalent of 24 academic counts; first matriculates of 1897-98 the equivalent of 48 academic counts or the academic diploma—the "Certificate" earned for the above respective years to be filed within one year after the first matriculation; first matriculates of 1898-99, the equivalent of the academic diploma, or 48 academic counts, the "Certificate" to be filed at the time of first matriculation.

These requirements were rigidly enforced, when in 1897-98 the first-year class-men numbered but fifty-eight, instead of the usual previous classes of one hundred or more. This small first-year class of 1897-98 brought the question of preliminary education to a crisis—the same conditions existed in the other dental institutions of the state—and the regents reduced the preliminary educational requirement for the "Dental Student Certificate" to three years of high school, or 36 academic counts; subsequently adding the proviso, that a student not holding his 36 counts at the commencement of his second lecture session could enter the same and also his third session and take the graduation examinations at the close of his third session, his degree and also his admission to the license examinations being withheld until two years after the obtaining of the last of his required academic counts.

It must be said here, that the regents by these conservative and judicious interpretations of the dental law had, from 1897-1901, successfully established the equivalent of three years of a New York State high school as the dental preliminary educational requirement of the state; a standard far in advance in 1901 of the requirements of all the dental institutions of other states.

During the session of the legislature of 1901 a bill was presented—without the previous knowledge of the regents' office or the dental institutions of the state—containing the provision of the immediate requirement of a preliminary education for the obtaining of the "Dental Student Certificate" equivalent to four years of high school, or 48 academic counts. The New York College of

Dentistry and the University of Buffalo Dental Department—with the cooperation of the regents office—opposed the bill, because of the abruptness of the transition from 36 to 48 counts, with the result of the postponement until January 1, 1905, for the preliminary educational requirement equivalent to four years of high school, or 48 academic counts, to go into effect. From 1901 to January 1, 1905, the requirements that had been in effect from 1897 to 1901 were continued. Since January 1, 1905, the legal rights of students matriculated prior to January 1, 1905, to obtain the "Dental Student Certificate" under the requirement of three years of high school, or 36 academic counts, has been and is maintained, while all students first matriculated since January 1, 1905, have been required to hold a preliminary education equivalent to 45 new (or 36 old) academic counts before entering their first session, and 60 new (or 48 old) academic counts before entering their second session.

From 1866-67 to 1907-08—forty-two years—there have been about 6,300 session attendances of students toward the degree exclusive of those registered but not attending—an average of about 150 per session. During the forty-two years, the degree of D. D. S. has been conferred upon about 1,875 men—an average of forty-five per year. In 1901 there were about 857 of 1,350 alumni in practice; at present at least 1,300 of 1,875 are in practice.

At the launching of the college in 1866 members of the board of trustees and directors contributed about \$4,000 to effect the same, which, however, came back to them from coupon session-attendance tickets which were taken by students. During the year the college received one state appropriation (1873) of \$3,750; and for one year a city appropriation of \$500; and two donations from Dr. Stephen A. Main of \$100 and \$1,000, respectively. Outside of these items of one loan and three donations, the college has, during the forty-two years maintained an independent and self-supporting career and carried a surplus fund. There never has been personal ownership or stock company basis. In all transactions the N. Y. C. D. has been party to the same—for example, in the purchase of the present college building, the transaction was in the name of the corporation and it is so recorded.

The uniform basis of action has been not to spare expense in affording the best possible advantages of plant and educational staff, and above all, on the part of the faculty members, to not spare personal time and labor in imparting the necessary education to the student body, irrespective of pecuniary returns.

In her career of forty-two years there has been at times almost the impossible to be accomplished and disappointments have had to be accepted. In spite of all these, the unflinching tenacity of purpose and indomitable perseverance

of her faculty members seconded by the ever-ready support of her non-professional trustees and directors, the work has been crowned with success, as evidenced by the national and international reputation of the N. Y. C. D. as the outcome of the professional careers of her alumni to be found today in every civilized country.

FACULTY, 1908-1909.

FANEUIL D. WEISSE, M. D., Dean, Professor of Anatomy, Surgical Pathology and Oral Surgery.

F. LEROY SATTERLEE, M. D., Ph. D., Professor of Physics, Chemistry and Metallurgy.

J. BETHUNE STEIN, M. D., Professor of Physiology, Visceral Anatomy and Histology; Director of normal histology laboratory.

ALFRED R. STARR, M. D., D. D. S., Professor of Operative Dentistry and Dental Therapeutics.

ELLISON HILLYER, D. D. S., Secretary; Professor of Prosthetic Dentistry and Orthodontia.

HENRY HEATH, JR., D. D. S., Clinical Lecturer on Operative Dental Surgery.

CHARLES F. RABELL, D. D. S., Clinical Lecturer on Prosthetic Dental Surgery.

HENRY H. HAWLING, B. S., Assistant to the Professor of Physics, Chemistry and metallurgy; Lecturer on Organic Chemistry; Director of Practical Chemistry and Metallurgy Laboratory.

CHARLES VETTER, JR., D. D. S., Assistant to the Professor of Operative Dentistry and Dental Therapeutics; Lecturer on Dental Therapeutics.

FRANCIS LEROY SATTERLEE, JR., A. M., Assistant to the Professor of Physics, Chemistry and Metallurgy; Lecturer on Physics and Radiology; Director of Practical Physics Laboratory; Director of X-Ray Laboratory.

FANEUIL S. WEISSE, A. B., M. D., Assistant to the Professor of Anatomy, Surgical Pathology and Oral Surgery; Lecturer on Osteology and Arthrology.

JAMES T. GWATHMEY, M. D., Lecturer on Anæsthesia.

SAMUEL WELLING VAN SAUN, D. D. S., Director of Dental Anatomy, Operative Technic, Porcelain Inlay and Gold Inlay Laboratory.

HENRY T. LEE, M. D., Director of Pathological Histology and Bacteriology Laboratory.

SAMUEL I. FREEMAN, D. D. S., Director of Prosthetic Technic Laboratory.

GEORGE P. WILLIS, D. D. S., Director of Porcelain and Gold Inlay Laboratory.

JULIUS T. WESTERMANN, M. D., Instructor in Normal Histology Laboratory.

EDW. W. BURCKHARDT, D. D. S., Instructor in Dental Anatomy, Operative Technic, Porcelain Inlay and Gold Inlay Laboratory.

SEWARD ERDMAN, M. D., Instructor in Pathological Histology and Bacteriology Laboratory.

EDWIN C. HAZELHURST, D. D. S., Instructor in Prosthetic Technic Laboratory.

A. M. O. BARTEL, D. D. S., Instructor in Prosthetic Technic Laboratory.

OSCAR J. CHASE, D. D. S., Instructor in Porcelain and Gold Inlay Laboratory.

R. A. COOKE, M. D., Instructor of Physical Examination and Treatment of Emergencies.

HENRY S. DUNNING, D. D. S., Chief of Oral Surgery Clinic.

MAURICE GREEN, D. D. S., Member of Oral Surgery Clinic.

ALEXANDER M. BIRKHAHN, D. D. S., Member of Oral Surgery Clinic.

WASHINGTON UNIVERSITY DENTAL DEPARTMENT.

MISSOURI DENTAL COLLEGE.

ST. LOUIS, MO.

BY JOHN H. KENNERLY, D. D. S., M. D.

At the first annual meeting of the Missouri State Dental Society, held in June, 1866, a committee was appointed to consider a proposition to form a dental college under the auspices of the society, with power to take such action as in its judgment the interests of the profession and of the public required.

The committee, after patient investigation of the subject, decided that the prospects of establishing a college in St. Louis were so encouraging at this time (the faculties of two medical schools having proffered the most liberal co-operation) that they determined to apply for a charter.

Under the general laws passed by the legislature of 1865-6 to govern the issue of such charters, it was found necessary to form an association. This corporate body consisted of the following members; Homer Judd, H. E. Peebles, E. Hale, Jr., William N. Morrison, W. H. Eames, G. W. Crawford, A. M. Leslie, Isaiah Forbes, H. J. McKellops, M. Westermann, Isaac Comstock, Alix. Dienst, William A. Cornelius, W. A. Jones, C. Knower, John P. Hibler, Edgar Park and Henry Barron.

The association appointed a board of Trustees as follows: Isaiah Forbes, D. D. S., President; A. M. Leslie, D. D. S., Secretary; H. E. Peebles, D. D. S., Treasurer; Charles A. Pope, M. D., J. S. Clark, D. D. S., S. H. Anderson, J. L. Knapp, W. O. Kulp, W. H. Ames, D. D. S., M. McCoy, M. D., Edwin Hale, Jr., C. W. Rivers, J. B. Johnson, M. D.

The facilities for establishing a dental school in St. Louis were peculiarly encouraging. The faculty of the St. Louis Medical College had shown a liberal spirit in offering the association the use of its lecture rooms and the advantages of its established museum and hospitals. The trustees felt that if the dental profession of the Mississippi valley would take hold of this new enterprise in a broad and liberal spirit, they could establish an institution which would reflect honor on the profession and prove a powerful lever in its elevation by the diffusion of science pertaining to dentistry.

As a result of the foregoing action, the Missouri Dental College, now the Dental Department of Washington University, was chartered on September 15, 1866. The first regular meeting of the faculty took place on September 24, in the election of Dr. Homer Judd as dean and Dr. Frank White as secretary. 1866, at the office of Dr. Judd, at the corner of Sixth and Pine streets, St. Louis. Dr. A. Litton was called to the chair. The business meeting resulted in the election of Dr. Homer Judd as dean and Dr. Frank White as secretary.

The only other business done at this meeting was to appoint Dr. Judd a committee of one to formulate a constitution and by laws for the government of the school. The first course of lectures began on Monday, October 1, 1866, and closed on February 22, 1867, the course at that time being five months.

The first faculty was composed of:

HOMER JUDD, M. D., Dean; Professor of the Institutes of Dental Science.
 C. W. STEVENS, M. D., Professor of General Descriptive and Surgical Anatomy.
 A. LITTON, M. D., Professor of Chemistry and Pharmacy.
 J. T. HODGEN, M. D., Professor of Physiology and Medical Jurisprudence.
 F. W. WHITE, M. D., Professor of Materia Medica and Therapeutics.
 E. H. GREGORY, M. D., Demonstrator of Anatomy.
 H. E. PEEBLES, D. D. S., Professor of Surgical and Operative Dentistry.
 W. H. EAMES, D. D. S., Professor of Artificial Dentistry.
 L. WINKLER, Curator.

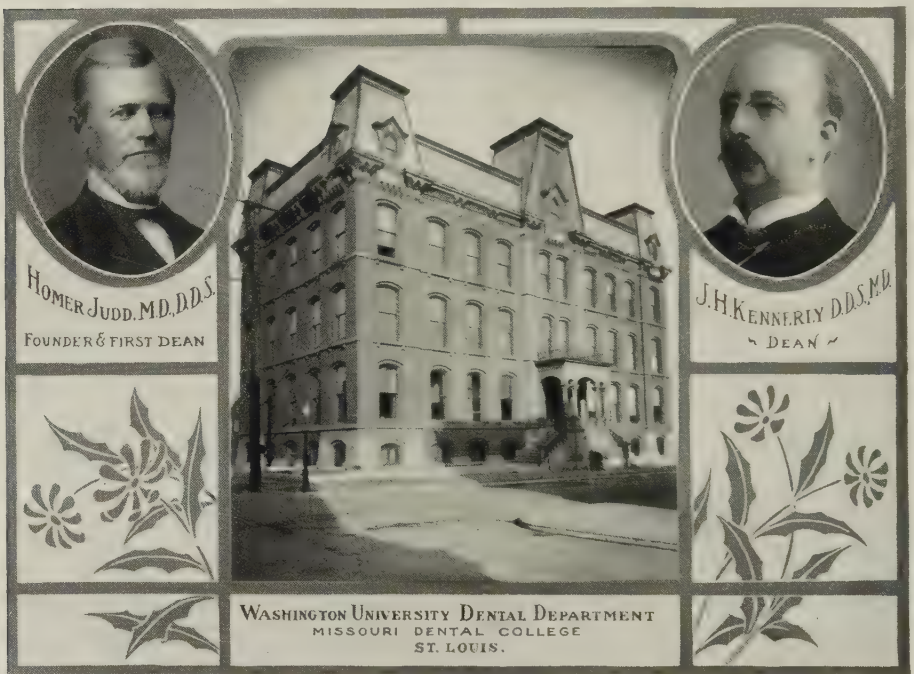
The first annual commencement was held in O'Fallon hall, Dr. Judd, dean of the faculty, delivered the valedictory on the subject of "The History and Progress of Dental Science." The following named, who were of that class, are still living: Drs. A. W. French, of Springfield, Ill., and G. A. Bowman, of St. Louis. Three of the graduates of this class afterwards became members of the faculty, Drs. G. A. Bowman, C. W. Rivers and Isaac Comstock.

At the second annual meeting of the faculty Dr. J. S. B. Alleyne succeeded Dr. White as professor of materia medica and therapeutics. He retained the chair from 1867 until 1891. He was also made secretary of the faculty at the same time. At this meeting it was decided that the course in the Missouri Dental College should close at the same time as the St. Louis Medical College, and that the commencements should be held jointly, an agreement which was continued for twenty-six years, up to and including 1900, at which time the first dental commencement was held alone, at Memorial hall, Nineteenth and Locust streets, St. Louis. The Missouri Dental College was the first one in the United States to deliver the greater portion of its lectures jointly with the medical students. At the second annual commencement there were three graduates, all of whom have since passed away.

At the third annual meeting Dr. John T. Hodgen was made professor of anatomy, Dr. Ellsworth F. Smith professor of physiology, Dr. H. S. Chase, commonly known as "Pa," professor of surgical and operative dentistry; Dr. John T. McDowell demonstrator of anatomy; Dr. William N. Morrison demonstrator of mechanical dentistry. The late Dr. Henry Fisher was a member of

the graduating class of this year, as were Doctors Parks and I. P. Wilson, of Burlington, Iowa. At this meeting Dr. E. H. Gregory was elected professor of the principles and practice of surgery, and his name has been in every catalogue issued since that time, he having been emeritus professor of surgery since 1900.

In the fifth class, graduating from the school on March 4, 1871, appears the name of Dr. A. H. Fuller. During the following year, 1872, Dr. A. H.



Fuller was made demonstrator of surgical and operative dentistry. He was elected secretary of the faculty in 1873, and filled that office continuously until the death of Dr. H. H. Mudd, in 1899, when he succeeded to the office of dean, Dr. G. A. Bowman being at that time adjunct professor of mechanical dentistry, Dr. Eames filling the chair as professor of the same.

On February 11, 1874, the entire faculty resigned in order that the trustees might fill the chairs again with perfect freedom. On June 20, of the same year, the following faculty was elected to fill vacancies caused by these resignations:

H. S. CHASE, Professor of the Institutes of Dental Science.
J. T. HODGEN, Professor of Anatomy.
A. LITTON, Professor of Chemistry.
G. BAUMGARTEN, Professor of Physiology.
J. S. B. ALLEYNE, Professor of Materia Medica.
E. H. GREGORY, Professor of Principles and Practice of Surgery.
C. W. RIVERS, Professor of Operative Dentistry.
A. H. FULLER, Professor of Mechanical Dentistry.
HOMER JUDD, Lecturer on Pathology.
W. H. EAMES, Lecturer on Metallurgy.
J. H. McDOWELL, Demonstrator of Anatomy.
R. H. MACE, Demonstrator of Operative Dentistry.
FREDERICK KEMPF, Demonstrator of Mechanical Dentistry.
C. W. RIVERS, Dean of the Faculty.

In 1875, Dr. W. H. Eames was elected professor of the institutes of dental science and dean of the faculty, and Dr. Isaiah Forbes was made professor of surgical and operative dentistry; Dr. M. A. Bartelson, professor of mechanical dentistry; Dr. H. H. Mudd demonstrator of anatomy; Dr. H. H. Keith, demonstrator of mechanical dentistry. The board of trustees for this year consisted of Isaiah Forbes, president; and A. H. Fuller, secretary. The following members composed the board: Drs. E. H. Gregory, H. Judd, E. Park, W. H. Eames, J. C. Goodrich, J. A. Price, G. V. Black, G. A. Bowman, W. N. Morrison, H. Newington, C. W. Rivers.

The only change that was made in the faculty for the term of 1876-7 was the election of Dr. H. H. Keith as professor of mechanical dentistry, Dr. N. Stark, as demonstrator of operative dentistry, and Dr. H. C. Mace as demonstrator of mechanical dentistry.

In 1877 Dr. I. Forbes was made emeritus professor of the institute of dental science and Dr. G. V. Black lecturer on histology and microscopy. Among the graduates of this year appear the names of Dr. D. J. McMillan, now the dean of the Western Dental College; Dr. A. J. Prosser and Dr. John G. Harper.

In 1878 Dr. J. Ward Hall, now of Shanghai, China, was made professor of surgical and operative dentistry; Dr. A. H. Fuller, professor of the institutes of dental science, and Dr. John G. Harper, demonstrator of operative and mechanical dentistry. There were only five graduates at the close of this term. Among them appears the name of Dr. G. V. Black, now dean of Northwestern University Dental School. On September 16, 1878, Dr. H. H. Mudd was elected dean of the Missouri Dental College, and served as such from that time until his death, which occurred on the 20th day of November, 1899. Dr. Mudd served as demonstrator of anatomy from 1875 to 1883, although he had been made

professor of anatomy in 1880. In 1886 he was made professor of surgical anatomy and clinical surgery.

In 1879 Dr. A. H. Fuller succeeded Dr. J. Ward Hall as professor of operative dentistry, a position which he filled for twenty-two years. Among the special lecturers of this year appear the names of Drs. G. V. Black, H. Judd, I. P. Wilson and John J. R. Patrick. Among the graduates were G. A. Bronson, of this city; Dr. G. A. McMillan, of Alton, Ill.; Dr. C. L. Hungerford, of Kansas City, long the professor of operative dentistry in the Kansas City Dental College; Dr. W. T. Stark, of Kansas City, professor of prosthetic dentistry in the same school.

In 1880 the school graduated but one man, Dr. J. C. Starkey, well and favorably known, especially in Tennessee, his native state.

In 1881 the school again graduated only one man, Dr. J. F. Hassell, of Lexington, Mo. The only change made in the faculty during this year was caused by the resignation of Dr. H. H. Keith as professor of mechanical dentistry, and the election of Dr. W. N. Morrison to fill the same.

In the year 1882, among the list of graduates appear the names of the following gentlemen who since their graduation have attained high standing in their profession: Dr. Thomas L. Gilmer, professor of oral surgery in Northwestern University Dental School, and Dr. J. J. R. Patrick, of Belleville, Ill., who was known as one of the most skillful gold workers of his day.

In the year 1883 only two men were graduated.

Among the graduates of 1884 who have attracted special attention were Dr. Alfred Blake, dean of the San Francisco Dental College, and Dr. Warwick Winston, who has been located in Shanghai, China, for some years.

In 1885 Dr. John G. Harper was made professor of mechanical dentistry. On the list of special lecturers for this year appear the names of Dr. Homer Judd, Dr. John J. R. Patrick, Dr. H. H. Keith and Dr. W. N. Morrison. Among the graduates of this year appears the name of Dr. H. C. Miller, dean of the North Pacific Dental College of Portland, Oregon.

In 1886 Dr. H. H. Mudd was made professor of surgical anatomy and clinical surgery, Dr. B. J. Prim being made professor of descriptive anatomy, the position formerly filled by Dr. Mudd.

For the season of 1887-8 was added a list of clinical instructors.

In 1888-9, Dr. George J. Dennis became demonstrator of operative dentistry and Dr. J. H. Kennerly demonstrator in charge.

In 1889-90 Drs. Paul Y. Tupper and Harvey G. Mudd were demonstrators of anatomy; George J. Dennis and J. E. Grossheider demonstrators of opera-

tive dentistry and mechanical dentistry, and J. O. Epright demonstrator in charge. Dr. Epright has been located in London, Eng., for some years. Among the graduates of this year are the names of Dr. Walter M. Bartlett, for a number of years professor of prosthetic dentistry, and Dr. W. A. Cummings, of Portland, Ore., for a time professor of operative dentistry in the Oregon College of Dentistry, which was consolidated with the North Pacific Dental College.

In 1891 Dr. W. M. Bartlett was made assistant professor of mechanical dentistry, and Dr. J. H. Prothero demonstrator of operative dentistry, having charge of the infirmary. Dr. Prothero is now professor of prosthetic dentistry in Northwestern University Dental School.

In 1892 the Missouri Dental College became the Dental Department of Washington University. The term opened in the new building, 1814 Locust street, on September 27, 1892.

In 1893 Dr. W. H. Eames was made superintendent of the infirmary, and remained in that position until his death, the following year.

In 1894 Dr. J. B. Vernon was made superintendent of the infirmary; Dr. DeCoursey Lindsley lecturer on dental therapeutics; Dr. O. W. Bedell lecturer on dental embryology and diseases of the teeth; Dr. M. R. Windhorst lecturer on operative dentistry; Dr. J. B. Kimbrough demonstrator of operative dentistry.

In 1895 Dr. O. W. Bedell was made professor of mechanical dentistry, and Dr. Sidney P. Budgett professor of physiology and histology.

In 1897 Dr. O. W. Bedell was made professor of the institute of dental science; Dr. R. R. Vaughn assistant professor of mechanical dentistry and superintendent of the infirmary, and Dr. C. W. Richardson demonstrator of dental technic.

The following year, 1898, Dr. E. H. Angle was made professor of orthodontia; Dr. C. W. Richardson professor of dental technique, and Dr. R. R. Vaughn professor of mechanical dentistry.

In 1899 Dr. A. H. Fuller became dean, to fill the vacancy caused by the death of Dr. Henry Mudd. Dr. O. W. Bedell was made secretary in place of Dr. Fuller. Dr. R. J. Terry was made assistant professor of anatomy, Dr. W. H. Warren assistant professor of chemistry, Dr. H. F. Cassell professor of mechanical dentistry, Dr. A. E. Matteson professor of orthodontia.

In 1900 Dr. J. H. Kennerly became professor of mechanical dentistry and secretary of the faculty, Dr. Hermann Prinz professor of dental medicine and metallurgy, Dr. H. F. Cassell assistant professor of mechanical dentistry.

In 1901 Dr. A. H. Fuller resigned from the faculty and was made emeritus professor of operative dentistry; Dr. J. H. Kennerly was elected dean of the faculty, to succeed Dr. Fuller; Dr. W. M. Bartlett was made professor of prosthetic dentistry; Dr. G. A. McMillan professor of operative dentistry, and Dr. B. E. Lisher, professor of orthodontia, dental anatomy and operative technic.

In 1902 Drs. R. J. Terry and William H. Warren were elected to professorships of the chairs of anatomy and chemistry, Dr. Willard Bartlett was made lecturer on oral surgery, and Dr. DeCoursey Lindsley lecturer on operative dentistry.

In 1903 Drs. Willard Bartlett, DeCoursey Lindsley and Bland Nixon Pippin were elected professors of the chairs which they had filled to the satisfaction of the faculty during the preceding year.

The faculty at present, 1908, is made up as follows:

MARSHALL SOLOMON SNOW, Acting Chancellor of the University.

ALBERT HOMER FULLER, M. D., D. D. S., Emeritus Professor of Operative Dentistry.

JOHN HANGER KENNERLY, M. D., D. D. S., Dean, Professor of Clinical Dentistry.

HERMANN PRINZ, B. S., Ph. G., D. D. S., M. D., Professor of Materia Medica, Therapeutics, Bacteriology and Pathology.

WALTER MANNY BARTLETT, D. D. S., Secretary, Professor of Prosthetic Dentistry.

BENNO EDWARD LISCHER, D. M. D., Professor of Orthodontia.

BLAND NIXON PIPPIN, D. M. D., Professor of Metallurgy and Physics.

RICHARD THOMAS BROWNRIGG, B. S., Professor of Dental Jurisprudence.

OLIVER HOWARD CAMPBELL, M. D., Professor of Physiology.

DECOURSEY LINDSLEY, M. D., D. D. S., Professor of Operative Dentistry.

HARRY MORGAN MOORE, M. D., Professor of Anatomy.

VILRAY PAPIN BLAIR, M. D., Professor of Oral Surgery.

JESSE DUNCAN WHITE, D. M. D., Lecturer on Crown and Bridge Work and Porcelain Art.

JAMES ALEXANDER BROWN, D. D. S., Assistant Professor of Histology and Embryology.

EWING PAUL BRADY, D. D. S., Assistant Professor of Chemistry.

FREDERICK WILLIAM HORSTMAN, D. D. S., Assistant Professor of Dental Anatomy and Instructor in Operative Technic.

HARRY FREDERICK D'OENCH, D. M. D., Lecturer on Clinical Dentistry and Ethics.

DEMONSTRATORS.

FLORIAN ADOLPH NEUHOFF, D. D. S., Prosthetic Dentistry.

WILLIAM RECTOR SMITH, D. D. S., Prosthetic Dentistry.

LEGRAND MARVIN COX, D. D. S., Operative Dentistry.

EDGAR HAYDEN KEYS, D. D. S., Operative Dentistry.

JESSE DUNCAN WHITE, D. M. D., Porcelain Technics.

GUY STOWELL, Chemical Laboratory.
URLING CAY RUCKSTUHL, Orthodontia.

SPECIAL LECTURERS.

GREENFIELD SLUDER, M. D., Rhinology of Mutual Interest for Dentists.
HARRY P. WELLS, M. D., The X-Ray in Dentistry.

HARVARD DENTAL SCHOOL.

BOSTON, MASS.

BY EUGENE H. SMITH, D. M. D.

The Harvard Dental School was instituted by vote of the president and fellows of Harvard College, July 17, 1867. Dr. Nathan Cooley Keep had, in 1865, in his annual address before the Massachusetts Dental Society, of which he was then president, suggested the need of a dental school in connection with Harvard University; and the movement which resulted in the establishment of the first dental school connected with a university thus took its beginning.

The first session of the school opened on the first Wednesday in November, 1867, and continued until the following March. It was the aim of the school to raise the standard of dental education by giving thorough instruction in all branches of science and art required by the dental practitioner. Its connection with the university gave to the public a guarantee that its standard would be high, as it must necessarily be to keep pace with the other departments of the university. It offered superior advantages, in that, while the instruction was no less thorough in those departments peculiar to dentistry, it gave the student unusual facilities for instruction in anatomy, physiology, surgery, and chemistry, as the dental student pursued the same course in those branches as was required of the medical student, and in common with him had free access to the hospitals of the city, to the dissection rooms, and to the library and museums of the medical college.

The first Faculty was composed of the following well known men:

THOMAS HILL, D. D., LL. D., President of the University.

NATHAN C. KEEP, M. D., D. D. S., Professor of Mechanical Dentistry and Dean of the Faculty.

OLIVER WENDELL HOLMES, M. D., Professor of Anatomy and Physiology.

HENRY J. BIGELOW, M. D., Professor of Surgery and Clinical Surgery.



JOHN BACON, M. D., Professor of Chemistry.

THOMAS B. HITCHCOCK, M. D., Professor of Dental Pathology and Therapeutics.

GEORGE T. MOFFATT, M. D., Professor of Operative Dentistry.

LUTHER D. SHEPARD, D. D. S., Adjunct Professor of Operative Dentistry.

ELBRIDGE G. LEACH, D. D. S., University Lecturer on Pathology and Therapeutics.

IRA A. SALMON, D. D. S., University Lecturer on Operative Dentistry.

NATHANIEL W. HAWES, Demonstrator of Operative Dentistry.

SAMUEL F. HAM, Demonstrator of Mechanical Dentistry.

CHARLES B. PORTER, M. D., Demonstrator of Practical Anatomy.

The first regular lecture season commenced on the first Wednesday in November and continued four months. There were no requirements for admission and in order to obtain the degree a candidate must have had three years' apprenticeship in an office, have attended upon two courses of lectures at the school, maintained a thesis and undergone an examination to the satisfaction of the faculty, and convinced the professors of operative and mechanical dentistry of his ability to meet satisfactorily the requirements of his art. He was also obliged to deposit with the dean, to be placed in the museum of the school, a specimen of mechanical dentistry, or of practical pathological anatomy, prepared during his course of instruction.

As Harvard University was the first classical institution to confer a degree upon dentists, the question arose as to what degree from a classical standpoint should be conferred. The degree of D. D. S., which was being conferred by the dental schools in existence was being written in the diplomas as follows,—“*Chirurgiae Dentium Doctoris*” the correct initials of which should be D. D. C. The degree “*Scientiae Dentium Doctoris*,” which would leave the initials of D. D. S. unchanged, was then considered, but was rejected on the ground that dentistry was not a science. It was finally decided to prefix the word “*Dentariae*” to the old degree of “*Medicinae Doctoris*” thus meeting the classical requirements and making a distinctive title for this branch of medicine.

The first examination of candidates for the degree was held March 6, 1869. As a result of this examination six candidates received the degree of D. M. D.

The infirmary was connected with the Massachusetts General Hospital and during the first year one thousand patients were treated for diseases of the teeth.

In 1871, laboratory instruction was introduced in the departments of anatomy, physiology, surgery, and chemistry. The following year the regular session began on the last Wednesday in September; continuing four months. This was called the “regular winter course” and two years later a “summer

course" was added, commencing upon the close of the "winter course" and continuing until the last week of June, thus establishing a nine month's course in each year, although attendance upon the winter course only was required for graduation.

The summer course was designed as an equivalent, entirely or in part, to pupilage with private preceptors, and was thought to afford better and more comprehensive instruction than a student could possibly obtain in a private office. There were then about thirty students in the school, and that year the regular commencement of the dental school was held in June, in Cambridge, in common with the other departments of the university.

In 1876, a radical change was made and an entirely new scheme of instruction went into effect. The course of instruction was uniformly distributed throughout the academic year and the distinction of winter and summer sessions was abolished. The year began on the Thursday following the last Wednesday in September and ended on the last Wednesday in June. The course of instruction was progressive and extended over two years. Regular examinations were held in the following order. At the end of the first year, anatomy, including dissection (three parts required) physiology, and chemistry; at the end of the second year, dental pathology, including a knowledge of gestation and diseases of women so far as they affect the mouth and throat, dental materia medica and therapeutics, oral surgery and surgical pathology, operative and mechanical dentistry. Each candidate for the degree was required to be twenty-one years of age, and of good moral character; he was required to give evidence of having studied medicine or dentistry three full years, one continuous year of which he must have spent in this school; also, to present a satisfactory thesis and pass all of the required examinations.

Following upon these advanced requirements, the number of students decreased.

With the exception of the development of each department along its special lines, few changes occurred during the following ten years, and the number of students increased, until in 1885, when an entrance examination in English and physics was established. This examination was held in nine different places in the United States, and had the effect of again lessening the number of students in the school.

In 1890 orthodontia was made a separate branch of study and a special course of lectures was given and a clinic established in the infirmary, where each student was given at least two cases of regulating to carry through to completion under guidance of the instructors. This was the first instance, of

which there is any record, of an orthodontia clinic being established in connection with a dental school.

In 1891, one more subject was added to the entrance requirements and the course in the school was made a graded one of three continuous years, all of which must be spent in the school. The certificate of one or two years of study in a private office, either of a dentist or of a physician, was no longer to be accepted. This decision on the part of the faculty caused much controversy, but the improvement in the quality of the work done by the candidates for the degree during the following years proved it to be a wise one, and the number of students rapidly increased.

During the summer of 1895, courses of lectures and clinics were given by the professors and instructors in the school on which eight students attended. The next year, beginning July 6, another course of four weeks was offered, and the course was repeated the following year, but these courses were all so poorly attended it was voted to discontinue them.

In 1897, one more subject was added to the requirements for admission and that again stopped the increase in the number of students.

The increase in the number of cases of fractured jaws that were constantly being sent to the infirmary from the different hospitals of the city necessitated the appointment of a special instructor in mechanical dentistry to attend to this work, and during this year sixty-five cases were treated.

On March 11, 1897, an emergency corps was established in connection with the school to give dental treatment to the sick poor at their homes. This service does not extend to the filling of teeth or the making of plates. Its object is simply the relief of pain. For seven years this corps consisted of selected men from the senior class who answered to calls and performed this relief work under the direction of an instructor. In 1904, however, this emergency work was put into the hands of graduates of the school, who were appointed as "dentists to out-patients," thus largely extending the scope of this beneficent work to the suffering poor.

In 1902, two more subjects were added to the entrance requirements which had the effect of reducing the numbers of students.

As an additional inducement for a higher grade of work in the various branches of dentistry the degree "D. M. D., cum laude," was established in 1898, and it was voted to confer the same upon all students who had pursued a three years' course in the school and obtained an average of eighty per cent or over in all of the required examinations.

From the first this department of the university has been closely connected

with the medical department, the first year of the dental student being taken at the medical school where he studied the same subjects at the same time with the medical students. It was, therefore, decided, in 1899, to discontinue the existence of the dental faculty and form a faculty made up of the president of the university and the professors of both of the departments, under the name of the faculty of medicine. An administrative board for the dental school was then formed and given power to perform all of the usual administrative acts attendant upon running the department, the final decision in regard to important changes resting in the Faculty of Medicine. This act upon the part of the president and fellows of Harvard College brought the two departments into still closer relationship.

In 1904, an entirely new order of entrance requirements was established as follows: All students who do not hold a degree in letters, science, or medicine, from a recognized college or scientific school, or who have not passed an examination to Harvard College or any other reputable college of letters, must pass the examination to Harvard College to the value of sixteen points. The next year, 1905, when the new requirements went into full effect the number of the entering class was cut in half, but as this has been the experience of the school after every advanced step it has taken, we think that it only requires time to recover its numbers.

A large school it never has been and may never be, as it is the aim of its Faculty to do all in its power to raise the standard of dental education regardless of the number of students it graduates.

In September, 1909, the school will move from its present building on North Grove Street, to the new building now in process of construction at the corner of Longwood Avenue and Wigglesworth Street. This building will have the latest hospital equipment and be used solely for hospital purposes.

It will contain a commodious infirmary, three operating rooms for oral surgery with connecting wards, prosthetic laboratory, office of administration, library, museum, students' room and reception room.

It will be connected by a subway with the Harvard Medical School buildings where all lectures will be given.

The Dental School is under the administration of the Faculty of Medicine, Charles W. Eliot, A. M., LL. D., President. The faculty consists of fifty-six members. The members of the Faculty who actually give courses to the Dental students are as follows:

THOMAS DWIGHT, M. D., LL. D., Parkman Professor of Anatomy.

CHARLES A. BRACKETT, D. M. D., Professor of Dental Pathology.

EUGENE H. SMITH, D. M. D., Professor of Clinical Dentistry and Orthodontia.

CHARLES S. MINOT, S. D., LL. D., D. S. C., James Stillman Professor of Comparative Anatomy.

EDWARD C. BRIGGS, M. D., D. M. D., Professor of Dental Materia Medica and Therapeutics.

HAROLD C. ERNST, M. D., Professor of Bacteriology.

WILLIAM H. POTTER, D. M. D., Professor of Operative Dentistry.

JOHN B. BLAKE, M. D., Instructor in Surgery.

EDWARD W. TAYLOR, M. D., Instructor in Neurology.

JOHN L. BREMER, M. D., Demonstrator of Histology.

WALTER B. CANNAN, M. D., George Higginson Professor of Physiology.

JOHN WARREN, M. D., Assistant Professor of Anatomy.

FREDERIC T. LEWIS, M. D., Assistant Professor of Embryology.

DAVID CHEEVER, M. D., Demonstrator of Anatomy.

BOSTON DENTAL COLLEGE.

BOSTON, MASS.

It seems strange that New England, always a leader in general education, should have neglected the organization of institutions for the teaching of the dental art and science until a number of colleges had been well established in Baltimore, Philadelphia, Cincinnati, St. Louis, New Orleans and New York.

Harvard Dental School, as a supplement to the medical school of that University, was founded in 1867 and the Boston Dental College one year later. From an article published several years ago by H. H. Piper, of Somerville, Mass., we learn that two students, with one year each of previous medical education, were graduated the following year. "This school was a continuation of the best elements and best traditions of the dental office, with the addition of a full quota of lectures in theory and practice. Here then were two schools, one allied to an older institution, the other independent; one laying emphasis rather on the theoretical side, the other on the practical, each with its ideals and its place to fill in the development of dental education."

Speaking particularly of the Boston Dental College, this author continues:

"It must appear at a glance that, in the beginning, it had elements both of strength and weakness; strength in its practical efficiency, which has never seriously been called in question, in its independence and open-mindedness toward new methods and new truths; weakness along lines of administration, where much was to be learned through experience, through the lack of funds and the inability to secure those varied helps which ought to be found in an

alliance with an old and well endowed institution. The men who took charge of the school at the beginning were many of them among the most prominent and skillful of their profession. Some of them were possessed of decided executive ability, but they had never been called to manage the affairs of an educational institution. Those early years were more or less stormy, dissatisfaction and discouragement were not unknown, but there were also present elements of devotion and self sacrifice, and there was constantly appearing vital energy which would not allow an institution with so evident a mission to languish and die.

"During the second decade, the membership of the classes increased rapidly and the average membership of the graduating classes for this period was twenty; during the third decade, the average number graduated each year was thirty-eight, and at the time of the union with Tufts College it was nearly fifty. The total of students who received a degree was 700. The course of instruction, at first two years, was extended to three years for 1884."

The first faculty of this college consisted of:

WILLIAM H. ATKINSON, M. D., D. D. S., Professor of Hygiene and Dental Jurisprudence.

AMBROSE LAWRENCE, M. D., D. D. S., Professor of Institutes of Dentistry.

W. S. MILLER, D. D. S., Adjunct Professor of Institutes of Dentistry.

I. J. WETHERBEE, D. D. S., Professor of Dental Science and Operative Dentistry.

C. G. DAVIS, D. D. S., Adjunct Professor of Dental Science and Operative Dentistry.

S. J. MCDUGALL, M. D., Professor of Dental Art and Mechanism.

H. F. BISHOP, D. D. S., Adjunct Professor of Dental Art and Mechanism.

R. KING BROWNE, M. D., Professor of Anatomy and Physiology.

J. P. ORDWAY, Adjunct Professor of Anatomy and Physiology.

L. R. SHELDON, M. D., Professor of Pathology and Therapeutics.

J. A. FOLLETT, M. D., Dean; Professor of Principles and Practice of Surgery.

F. W. CLARK, S. B., Professor of Chemistry and Metallurgy.

G. M. PEASE, M. D., Demonstrator of Anatomy.

In the earlier part of the school's existence it changed location frequently, always for the purpose of bettering its situation and increasing its accommodations.

Notwithstanding the lack of endowment and the frequent shortage of funds during the progress of this school, which necessitated the free giving on the part of the men interested in its conduct, it finally overcome all difficulties and even accumulated some property, so that at the time of transfer to Tufts

College nearly \$43,000 was turned over to that institution. Much of this is due especially to two men who, throughout all its vicissitudes, remained steadfast and true to the purposes and ideals of its beginning—Dr. I. J. Wetherbee, who was president of the board of trustees for nearly the entire period, and Dr. J. Follett, who was dean for many years and a member of the faculty.

Again quoting from Dr. H. H. Piper: "It can only be added that good work never dies and that the Boston Dental College, itself a growth out of the past, will live on worthily under another name and never cease to exercise an influence for good."

TUFTS COLLEGE DENTAL SCHOOL.

BOSTON, MASS.

BY HENRY H. PIPER, SOMERVILLE, MASS.

The Tufts College Dental School is a continuation of the Boston Dental College. The nature of the relations of these two schools, each to the other, may best be judged by an extract from the catalogue of Tufts College for the year 1899-00. Under the heading "Historical Sketch" appears the following:

The Medical school finds its complement this year in the Tufts Dental School, organized by the absorption of the Boston Dental College, which was incorporated in 1863, and has a numerous body of alumni. The equipment, funds and good will of this school passed to Tufts College.

Under the section of the catalogue devoted to the dental school appears the following.

The transfer (of the Boston Dental College) to Tufts College was in consequence of the new anatomical laws of the state, and because it was felt by its former Board of Trustees that the advances in dental education rendered it desirable that the more purely scientific portions of its curriculum should be pursued in connection with a medical school.

In the transition of the school from an independent to an associate existence



Edward
Walter Branigan
A.M. D.D.S.
Professor of
Clinical Dentistry



Prosthetic Department



Harold Williams
A.B., M.D., L.D.
Dean and Professor of the
Theory and Practice
of Medicine



TUFTS COLLEGE DENTAL SCHOOL



Frederick
Mortimer Hemenway
D.M.D.
Professor of
Prosthetic Dentistry



Infirmary



Frederic
Melancthon Briggs
A.B., M.D.
Secretary and
Professor of
Clinical Surgery

there were changes in character and ideals both sudden and gradual. Some of the sudden changes will at once be suggested to any one even slightly acquainted with the management of an educational institution having different departments, and especially when there are closely allied departments like a medical and a dental. The school no longer sufficient unto itself at once felt the restraint which a family life imposes. It lost its freedom—one might say its over freedom—of action. It gained in stability.

With the change in name came very material changes in the governing board and changes equally great in the corps of instructors, with the exception that in the operative and mechanical departments men and methods were not materially disturbed. The scope of the school was enlarged; new departments were added.

As soon as practicable the degree granted to graduates was changed from D. D. S. to D. M. D. In brief, on the theoretical side of professional training and in matters more external, changes were often sudden. On the practical side they were more gradual. Very soon it was felt that a new impetus had been given to the school; it responded to the pulse of the larger institution.

In the broader outlook both instructor and student shared. New ideals were born of new conditions. Higher standards of admission were established till at the present time nothing less than a high school education is accepted.

The growth of the school in numbers has been, on the whole, gradual. The Boston Dental College, during its early years, enrolled from half a dozen to a dozen students in a class. These numbers increased, with slight fluctuations as the requirements for admission were raised until in 1899 the total enrollment was about 150. The total number of students in the school during its first year as a department of Tufts College (1899-00) was 165. In 1904-05 200 were enrolled; in 1906-07, 265.

The instructing force at present numbers more than one hundred.

It would not be too much to say, perhaps, that the school is abreast of the best modern dental schools in buildings, equipment, opportunity for special study including evening classes, corps of instructors, and that forward look without which all else is inadequate.

The faculty now is composed of these professors and a large corps of instructors and lecturers:

FREDERICK WILLIAM HAMILTON, A. M., D. D., LL. D., President.

HAROLD WILLIAMS, A. B., M. D., LL. D., Dean, and Professor of the Theory and Practice of Medicine.

FREDERIC MELANCTHON BRIGGS, A. B., M. D., Secretary and Professor of Clinical Surgery.

CHARLES PAINE THAYER, A. M., M. D., Professor of Anatomy, Emeritus.

HENRY JABEZ BARNES, M. D., Professor of Hygiene.

CHARLES ALFRED PITKIN, A. M., PH. D., Professor of General Chemistry.

EDWARD WALTER BRANIGAN, A. M., D. D. S., Professor of Clinical Dentistry.

FRANK GEORGE WHEATLEY, A. M., M. D., Professor of Materia Medica and Therapeutics.

JOSEPH KING KNIGHT, D. M. D., Professor of Prosthodontia.

GEORGE ANDREW BATES, M. SC., D. M. D., Professor of Histology.

FREDRICK MORTIMER HEMENWAY, D. M. D., Professor of Prosthetic Dentistry.

WILLIAM ELISHA CHENERY, A. B., M. D., Professor of Diseases of the Nose and Throat and Instructor in Oral Syphilis.

TIMOTHY LEARY, A. M., M. D., Professor of Pathology and Bacteriology.

EUGENE THAYER, A. M., M. D., Demonstrator of Anatomy.

GEORGE VAN NESS DEARBORN, A. M., M. D., PH. D., Professor of Physiology.

BYRON HOWARD STROUT, D. D. S., Assistant Professor of Operative Technics and Instructor in Anesthesia.

WALTER IRVING BRIGHAM, D. M. D., Assistant Professor of Operative Dentistry.

FRANK ALEXANDER DELABARRE, A. B., D. D. S., M. D., Assistant Professor of Orthodontia.

HARRY HOMER GERMAIN, M. D., Assistant Professor of Anatomy.

COLLEGE OF DENTAL SURGERY OF THE UNIVERSITY OF MICHIGAN.

ANN ARBOR, MICH.

BY N. S. HOFF, D. D. S.

The College of Dental Surgery of the University of Michigan was organized in 1875. In 1873 the state dental society petitioned the board of regents of the university for the establishment of a dental department. The following year the state legislature made the first appropriation of \$3,000 for the purpose of organizing a dental department of the university.

In May, 1875, Dr. Jonathan Taft, of Cincinnati, was appointed professor of the theory and practice of operative dentistry and Dr. John A. Watling, of Ypsilanti, professor of clinical and mechanical dentistry. The first session of the department was held in 1875, beginning in October and extending to April, 1876.

The course of study for graduation was two terms of six months each. In

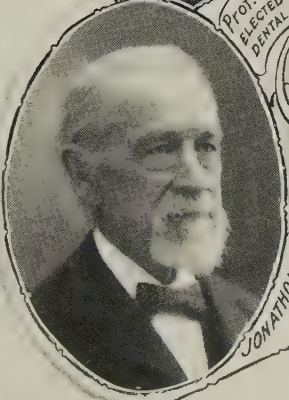
UNIVERSITY OF MICHIGAN



PROF. W.D. MILLER
ELECTED DEAN OF THE
DENTAL DEPT. T. IN 1906



N.S. HOFF D.D.S.
SECY OF THE DENTAL FACULTY



JONATHAN TAFT
1ST DEAN



BUILDING FOR DENTAL COLLEGE
UNIVERSITY OF MICHIGAN NOW BUILDING

October, 1884, the sessions were extended to nine months each. In October, 1889, the course was extended to three years of nine months each.

This college was the first dental school in the United States to adopt a nine months' session and the first to adopt a three years' course.

Beginning with September, 1901, this school adopted a course of four years for graduation. This was maintained for three years, but abandoned in 1904 because of the action of the National Association of Dental Faculties, which had agreed to establish the four years' course in all colleges, in returning to the three years' course after a trial of one year of the longer requirement.

The regents of the University of Michigan felt that it would not be wise to continue longer a four years' course in view of the fact that its dental department would have to stand alone in the long requirement.

While the attendance at the University of Michigan dental department has not reached the numbers enrolled at several of the larger schools of the country, it has always had a good and increasing attendance. Its high standards of admission and scholastic attainments have tended to keep its attendance down. Because the university is supported entirely by the state it has been possible for the management to set higher standards and maintain stricter discipline than many unendowed and private schools could do.

Because of the high educational ideals held by Dr. Taft, who was the dean of the school from its organization until 1903, the school has always stood among the first of the dental educational institutions of the country. The close organic connection of the dental college with the university has enabled it to secure the services of the eminent medical and scientific teachers connected with the university. This has resulted in good to professional education, as the standards have been broad and high because of the instruction of such teachers. The university facilities in general have also contributed much to the value and character of the instruction imparted. The technical departments have always been under control of able dentists who have devoted the larger part of their time to teaching.

Dr. Jonathan Taft served the college for twenty-nine years and directed its business as well as educational policy. Dr. John A. Watling served as clinical teacher of practical dentistry for twenty-eight years. Dr. W. H. Dorrance was teacher of prosthetic dentistry for twenty-five years. Dr. N. S. Hoff has served as teacher of dental therapeutics and technical dentistry from January, 1888, to the present time.

Among those who have been connected with the technical department of technical instruction for shorter periods should be mentioned Drs. W. H. Jack-

son, Calvin Case, U. D. Billmeyer, E. T. Loeffler, at present professor of dental therapeutics; L. P. Hall, at present professor of operative dentistry and who has been on the operative staff of teachers since his graduation in 1889; A. W. Haidle, who was instructor of prosthetic technics for six years; R. B. Howill, who has been instructor in prosthetic technics and lecturer on comparative dental anatomy and crown and bridge work since 1898, and E. L. Whitman, instructor in prosthetic technics since 1904.

After the death of Dr. Taft, in the fall of 1904, Dr. C. G. Darling was acting dean. Dr. Willoughby D. Miller, the eminent dental scientist, was made dean in 1906, but died before taking up active work in 1907.

In the thirty-two years of its existence the dental department of the university has graduated nearly 1,300 dentists. They are scattered all over the world. Many of them are natives of foreign countries who came here for their professional education and returned to their homes to practice.

The history of this school has been one of continued educational progress and it seems destined to continue this policy. Being fully endowed and supported by the state there should be no reason why it should not take the highest educational rank.

Dr. Jonathan Taft was the first dean of this school. He was selected by the board of regents, in 1875, to organize the department. This office he filled until the year of his death, 1903. He had held a similar office as dean of the faculty of the Ohio College of Dental Surgery for nearly twenty years before coming to Michigan. His ideals of professional education were high and he did all in his power to elevate educational standards throughout the country, and during his twenty-eight years of work at Michigan he never lost an opportunity to advance the standards of instruction, which resulted in giving this school an enviable reputation.

At the death of Dr. Taft, Dr. C. G. Darling, professor of oral surgery in the dental faculty, was made acting dean, and served three years until Dr. W. D. Miller, of Berlin, was ready to take the place in 1907.

Dr. W. D. Miller was called to the professorship of dental histology and pathology in 1906, but he could not sever his connections with the University of Berlin until the summer of 1907. He moved to this country in July, 1907, with his family. He came to Ann Arbor, and spent a few days in arranging for his work and for moving his household goods, and then went to his farm at Alexandria, O., where he was born, for a week or two of recreation. While there he developed appendicitis, for which he was operated at the Newark, Ohio, city hospital, and died July 27, 1907. He never did any teaching

at the University of Michigan, but he made plans for work that are to be carried forward as far as they can be. A new building and laboratories for dental scientific research are a part of these plans which are now completed and occupied.

After the death of Dr. Miller, Dr. N. S. Hoff, who for nearly twenty years has served the university as secretary of its dental faculty, was made acting dean. Dr. Hoff is a graduate of the Ohio College of Dental Surgery, class of 1876. He was for twelve years professor of dental medicine, and for the past six years has been professor of prosthetic dentistry, at the College of Dentistry of the University of Michigan.

The present (1908) faculty consists of the following:

- JAMES B. ANGELL, LL. D., President.
- NELVILLE SOULE HOFF, D. D. S., Professor of Prosthetic Dentistry.
- LOUIS P. HALL, D. D. S., Professor of Operative and Clinical Dentistry.
- EGBERT T. LOEFFLER, B. S., D. D. S., Professor of Dental Therapeutics.
- CYRENUS G. DARLING, M. D., Clinical Professor of Oral Surgery and Lecturer on Oral Pathology and Surgery.
- MARCUS L. WARD, D. D. Sc., Professor of Dental Physics and Chemistry.
- ROBERT BROWN HOWELL, D. D. S., Instructor in Comparative Anatomy and Crown and Bridge Work.
- MILTON T. WATSON, D. D. S., Lecturer on Orthodontia.
- ELMER L. WHITMAN, D. D. S., Instructor in Prosthetic Technics.
- RUSSELL W. BUNTING, D. D. Sc., Instructor in Dental Histology and Pathology.
- HERBERT HUTCHINSON HARPER, D. D. S., Instructor in Clinical Dentistry.
- CHALMERS J. LYONS, D. D. S., Instructor in Porcelain and Assistant in Oral Surgery.
- ROBERT C. SIMMONS, D. D. S., Assistant in Clinical Dentistry.

UNIVERSITY OF TENNESSEE, DENTAL DEPARTMENT.

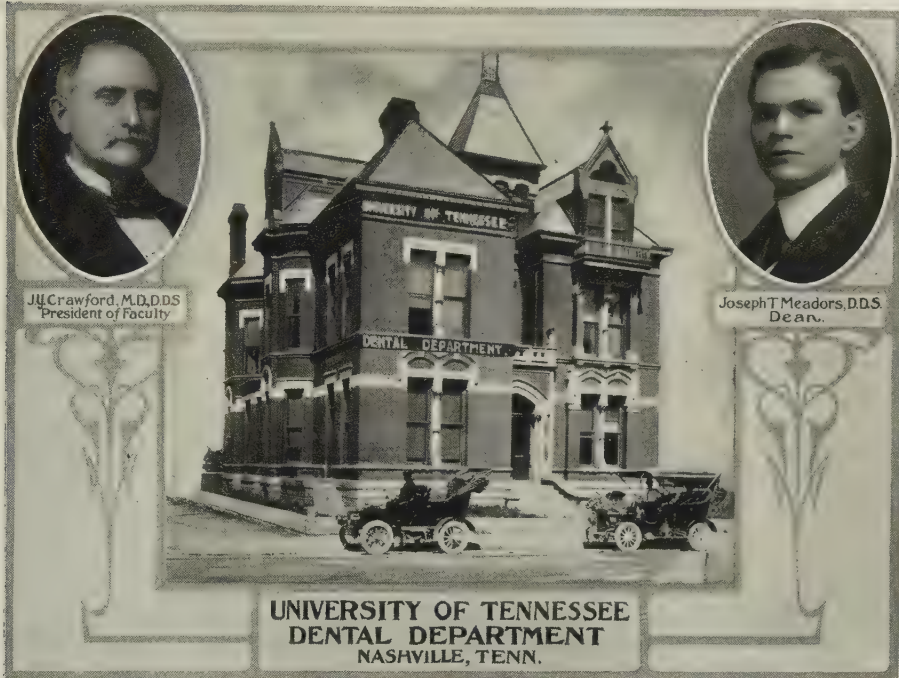
NASHVILLE, TENN.

BY STANLEY L. RICH, D. D. S.

The dental department of the University of Tennessee was organized and put into operation in the city of Nashville in connection with the New Nashville Medical college, in 1877, by Robert Russell, M. D., D. D. S., who was its first dean. He had associated with him that year some of the most prominent men of the dental profession in Tennessee: Dr. H. E. Beach, of Clarksville; Dr. John Arrington, of Jackson; Dr. Custer, of Memphis, and Dr. W. L. Dismukes, of Nashville.

The school was located on Market street near the public square.

After the close of the first session the dental and medical colleges were taken into the state university and made respectively the dental and medical departments of the University of Tennessee. The following men made up the faculty of the dental department:



ROBERT RUSSELL, Dean; Professor of Operative Dentistry.

L. C. CHISHOLM, Professor of Mechanical and Corrective Dentistry.

FRANK GLENN, Professor of Anatomy.

DUNCAN EVE, Professor of Surgery and Microscopy.

WILLIAM VERTREES, Professor of Materia Medica and Therapeutics.

CHAS. E. RISTINE, Professor of Physiology.

GEORGE S. BLACKKEY, Professor of Chemistry and Toxicology.

W. L. BISMUKES, J. Y. CRAWFORD, GILLINGTON CHISHOLM, Demonstrators of Operative and Mechanical Departments.

DR. RODGERS, Demonstrator of Anatomy.

At the close of the second session, in 1879, Dr. Chisholm resigned the chair

of mechanical and corrective dentistry and Dr. J. Y. Crawford was elected to the same.

The school continued under the deanship of Dr. Russell until the close of the session of 1883, at which time he resigned and asked that the faculty elect Dr. Crawford to the position of dean and professor of operative dentistry, which accordingly was done.

In 1883, Dr. R. B. Lees was added to the faculty as professor of mechanical dentistry and in this year the school moved to Broad street. The school continued to grow rapidly and it was soon deemed advisable to move into larger quarters on the other side of Broad street.

In 1889 Dr. Crawford resigned the deanship and Dr. R. B. Lees was elected in his stead, and also made professor of operative dentistry. He associated with him Dr. Fowler, of Greenville, Tenn., and Dr. J. P. Gray, of Sedalia, Mo., as professors of mechanical dentistry.

After some years Dr. Lees resigned his position and Dr. J. P. Gray was made dean. At this time Dr. R. Boyd Bogle was made a member of the faculty and a few years later the department was moved to the Wilcox building, at Church and High streets, at which place it remained until 1898, when the Tulane Hotel Company constructed for the especial accommodation of the department a building on North Spruce street.

The dental department University of Tennessee was the second dental college organized in the southwest proper and the University of Tennessee is the oldest state university in the United States.

It is interesting to note that through its entire history of thirty years the dental department of the University of Tennessee has had an annual increase of students, excepting the two years, 1883 and 1905.

The school has recently purchased a large three story building centrally located on one of the principal thoroughfares of Nashville, adjoining the custom house and post office and Federal park. This entire building, when remodeled, will be devoted to the teaching of modern dental surgery.

This school has always maintained the idea that dental surgery is a definite and bonafide specialty of medicine and should be taught and practiced as such.

In 1905 several changes were made in the faculty and as a result of these changes the present (1908) faculty is composed of:

J. Y. CRAWFORD, M. D., D. D. S., President; Professor of Clinical Dentistry.

JOSEPH T. MEADORS, D. D. S., Dean; Professor of Operative Dentistry and Dental Pathology.

STANLEY L. RICH, D. D. S., Secretary; Professor of Prosthetic Dentistry.

- D. B. BLAKE, M. D., Treasurer; Professor of Materia Medica and Therapeutics.
 HARRY A. HOLDER, D. D. S., Professor of Dental Histology, Dental Anatomy, Crown and Bridge Work.
 S. R. HARDISON, D. D. S., Professor of Orthodontia and Porcelain Art.
 JAMES S. WARD, A. B., M. D., D. D. S., Professor of Chemistry and Metallurgy.
 WILLIAM D. SUMPTER, M. D., Professor of General and Oral Surgery.
 T. F. DUNN, M. D., Professor of Anatomy.
 R. O. TUCKER, M. D., Professor of Histology.
 W. J. O'CALLAGHAN, M. D., Professor of Physiology.
 R. L. JONES, M. D., Professor of Bacteriology and Pathology.
 W. B. CAMPBELL PILCHER, A. B., LL. B., Professor of Dental Jurisprudence.
 WILLIAM P. FLY, D. D. S., Lecturer on Technic, Crown and Bridge Work.
 J. S. WARD, A. B., M. D., D. D. S., Director of Laboratory of Chemistry.
 R. L. JONES, M. D., Director of Laboratory of Histology, Bacteriology and Pathology.
 E. M. SANDERS, M. D., Director of Laboratory of Anatomy.
 W. P. FLY, D. D. S., Assistant to Chair of Prosthetic Dentistry.
 GEORGE E. HATCHER, M. D., Assistant to Chair of General and Oral Surgery.
 E. M. SANDERS, M. D., Assistant to Chair of Anatomy.
 W. P. FLY, D. D. S., Demonstrator in Chief.
 C. O. RHEA, D. D. S., Assistant Demonstrator of Junior Laboratory.
 G. L. PARKS, D. D. S., Assistant Demonstrator of Freshman Laboratory.
 E. M. SANDERS, M. D., Demonstrator of Anatomical Laboratory.
 E. G. WAGNER, M. D., Demonstrator of Histology, Bacteriology and Pathology.
 JAMES S. WARD, M. D., Demonstrator of Chemistry and Metallurgy.

THE ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

TORONTO, ONT.

BY STANLEY L. RICH, D. D. S.

The development of the Royal College of Dental Surgeons of Ontario as one of the educational institutions of the province is so closely associated with the growth and development of the dental profession as not to be separable from it. Previous to the year 1867, dentistry in Ontario had no organization and no standard of qualification. Men entered on practice, such as it was, after a private pupilage of from three to twelve months. Many of these were men of fair general education and studious habits. In time they acquired a good measure of scientific knowledge and a high degree of manipulative skill.

The older practitioners recognized the importance of organization and co-operation in raising the standard of their calling. Early in 1867, the Dental




THEOPHILUS W. STUART M.B., M.D., C.M.
 Prof. of Chemistry and
 of Anatomy 1877-8.




C.S. CHITTENDEN L.D.S., D.D.S.
 Chairman Board of Directors 1875-6



LUKE TESKY L.D.S., M.D., C.M.
 Prof. of Physiology and of the
 principles of medicine and surgery 1875-6



ROYAL COLLEGE of DENTAL
 SURGEONS of ONTARIO



J. BRANSTION WILLMOTT L.D.S., D.D.S.
 DEAN, Prof. of PROSTHETIC DENTISTRY
 OPERATIVE DENTISTRY AND DENTAL PATHOLOGY 1875-6.

Association of Ontario was organized, largely through the efforts of B. W. Day, M. D., of Kingston.

The first regular meeting was held in Cobourg, in July, 1867, when the preliminary steps were taken to procure an act incorporating the profession. At the second meeting of the association, held in Toronto in January, 1868, fully ninety per cent. of the practicing dentists were present.

The first legislature of the province was then holding its first session. The association prepared and had presented to the legislature by the late Dr. Boulter, one of the members from Hastings, a petition asking for the passing of an act regulating the practice of dentistry in Ontario. The "Act respecting Dentistry" received the assent of the Lieutenant-Governor on March 4, 1868.

This act incorporated the dentists of Ontario under the corporate title of the "Royal College of Dental Surgeons of Ontario," and placed the control of the college in the hands of a board of directors elected by the members of the college, the term of office being two years.

An important part of the duty of the Board was to see that entrants into the profession were properly qualified, and, incidentally, if necessary, to provide educational facilities for their professional training. At this date (1868) there were already in the United States ten colleges which had been established for the purpose of giving systematic instruction in dentistry.

During the summer of 1869 arrangements were made for opening a teaching department in Toronto. The medical subjects of the curriculum were to be taken at the Medical College of Victoria University. The course was announced to commence on October 1, 1869. Rooms were secured and fitted with needed appliances for teaching dentistry, both didactically and practically. The experience of one term, however, proved conclusively that the undertaking was premature, and it was abandoned at considerable financial loss.

In 1875 another attempt was made to furnish the needed instruction, but on a much less pretentious scale. At the request of the board, Dr. J. B. Willmott and Dr. Luke Teskey undertook to establish the "School of Dentistry," of the Royal College of Dental Surgeons, under the direction and supervision of the directors, and with a small definite financial assistance from them, the faculty taking the lecture fees and assuming the entire financial responsibility.

The first class, numbering eleven, began work on November 2, 1875. This arrangement continued until the close of the session of 1892-3. The attendance at the school having reached ninety, the time was opportune for placing it on a more permanent footing and in closer relation to the profession.

By a bylaw of the directors it was made an integral part of the Royal Col-

lege of Dental Surgeons, the directors assuming full control, receiving all fees, making all disbursements, formulating the curriculum, as well as appointing all professors and teachers and paying them fixed salaries.

From year to year the number of students has increased. Up to and including the session of 1907-8, 1,052 students had complied with the requirements prescribed by the curriculum and received from the Royal College of Dental Surgeons of Ontario the diploma of L. D. S. (Licentiate of Dental Surgery) which carries the legal right to practice dentistry in Ontario.

The premises first occupied were two rooms rented in a business block. This accommodation was increased from time to time, as it became necessary, by renting more commodious premises. In 1895 it became apparent that to secure adequate facilities for the school, it would be necessary to erect buildings especially designed for college purposes.

The building now occupied by the school on College street was formally opened by Lieutenant-Governor Kirkpatrick October 1, 1896. This building was enlarged for the first time in 1898, but it was soon outgrown again, and a second large addition was erected in 1902. This building, containing lecture rooms, laboratories, infirmary, and administration offices, with the necessary equipment for the successful teaching of a class of two hundred students, does not now afford sufficient accommodation and plans are completed for the erection of a new and much larger building.

The entire property, including furniture and equipment, has cost a little over \$85,000, but could not now be replaced for less than \$120,000. It belongs to the dentists of Ontario and has been provided entirely by the surplus fees from the school, without any public or outside aid.

From a very modest commencement the curriculum has been widened and extended until it now includes among its requirements matriculation in the Faculty of Arts of the Provincial University, or a fair equivalent, as the standard of entrance; a continuous pupilage of three years and a half, under indentures; and, during that period, attendance on four courses of instruction of seven months each.

As the act of incorporation gave the college no authority to grant academic degrees, it was thought desirable to secure affiliation with one of the universities for the purpose of securing a curriculum in dentistry leading up to a degree of Doctor of Dental Surgery, the degree conferred by American universities having dental faculties or departments. In 1873, after conference with several members of the senate, a formal application was made for affiliation with the University of Toronto. Apparently the time was unpropitious; the

application was neither refused nor granted. During the next three or four years formal or informal application was made to each of the other universities in Ontario, but in each case with unsatisfactory results.

In the meantime the school of dentistry had been organized, and was developing respectable proportions, having reached in 1887-8 an attendance of forty-two. Early in 1888, in pursuance of the policy of Sir William Mulock, then vice-chancellor of the University of Toronto, who desired to widen the influence and scope of the university by the affiliation of enterprising and progressive professional schools and colleges, it was intimated to the directors of the college that if an application were made to the university for affiliation, it would receive very careful consideration. Acting upon this intimation, on March 15, 1888, formal application was made. It was favorably received by the senate, and on May 25, 1888, a statute was passed affiliating the Royal College of Dental Surgeons of Ontario with the University of Toronto.

A curriculum in dentistry leading up to the degree of Doctor of Dental Surgery was formulated in time for the session of 1888-9, and the first class, numbering twenty-five, graduated at a special convocation held April 22, 1889. Since that date classes have graduated each year, the total on the roll of the University, including the class of 1908, being 817.

The University accepts the intermediate examination of the college, but conducts its own final examination. The curricula of the college and university have been harmonized, so that, commencing with 1894, the final examinations of the university department of dentistry and of the Royal College of Dental Surgeons have been conducted by a board of dental examiners appointed jointly by the university and the college, and under the joint supervision of both bodies, and consequently only one examination is now written for the degree of D. D. S. and the college diploma of L. D. S., the latter being the legal qualification for the practice of dentistry in the province of Ontario.

Commencing with that of 1900, the special convocation of the university for conferring degrees in dentistry has been held jointly with the commencement of the Royal College of Dental Surgeons, which lends added interest to both functions.

The faculty at this time (1908) is composed as follows:

FACULTY.

J. BRANSTON WILLMOTT, D. D. S., M. D. S., Dean, Professor Emeritus of Operative and Prosthetic Dentistry.

W. T. STUART, M. D., C. M., Professor of Chemistry and Anatomy.

W. EARL WILLMOTT, L. D. S., D. D. S., Professor of Clinical Dentistry.

JOHN J. MACKENZIE, B. A., M. B., Professor of Histology, Bacteriology and Comparative Dental Anatomy.

A. PRIMROSE, M. B., C. M., Edin., M. R. C. S., Eng., Professor of Surgery.

A. E. WEBSTER, L. D. S., D. D. S., M. D., Professor of Operative Dentistry and Dental Pathology.

A. W. THORNTON, L. D. S., D. D. S., Professor of Crown and Bridge Work.

F. A. CLARKSON, M. B., Professor of Physiology.

G. G. HUME, L. D. S., D. D. S., Professor of Orthodontia.

G. M. HERMISTON, B. A., L. D. S., D. D. S., Professor of History and Ethics.

J. B. WILLMOTT, D. D. S., M. D. S., Lecturer on Dental Jurisprudence.

E. F. BURTON, B. A., Lecturer on Physics.

W. E. CUMMER, L. D. S., D. D. S., Professor of Prosthetic Dentistry and Metallurgy.

HAROLD CLARKSON, L. D. S., D. D. S., Professor of Materia Medica and Pharmacology.

F. D. PRICE, L. D. S., D. D. S., Instructor in Electro-Therapeutics.

W. E. CUMMER, L. D. S., D. D. S., A. A. STEWART, L. D. S., D. D. S., Instructors in Clinical Dentistry.

EDGAR W. PAUL, L. D. S., D. D. S., Instructor in Anesthesia.

W. T. STUART, M. D., C. M., Demonstrator of Practical Chemistry and Metallurgy.

UNIVERSITY OF PENNSYLVANIA, DENTAL DEPARTMENT.

PHILADELPHIA, PA.

BY W. L. J. GRIFFIN, D. D. S., WITH ADDITIONS

BY JAMES TRUMAN, D. D. S., LL.D.

In 1877 the University of Pennsylvania became interested in the project of establishing a dental department in connection with that of medicine, and, on December 10th, the medical faculty directed the following letter to be sent to the dean of the Pennsylvania College of Dental Surgery:

University of Pennsylvania, Medical Department,
Philadelphia, Dec. 10, 1877.

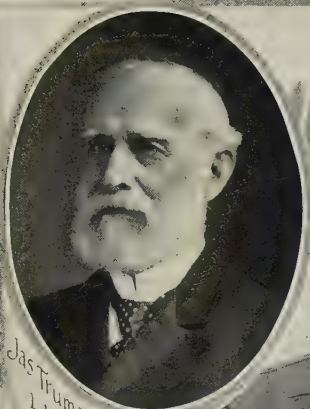
Dr. Chas. J. Essig, Dean of the Pennsylvania College of Dental Surgery.

MY DEAR SIR:—

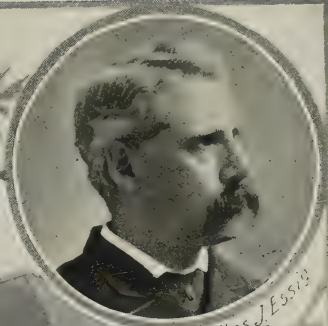
At a special meeting of the medical faculty held this evening, it was, on motion, "Resolved, that this faculty make overtures to the faculty of the Pennsylvania College of Dental Surgery, with a view to the union of the latter college with the University of Pennsylvania as its Dental Department."

And on motion it was further "Resolved, that Professors Joseph Leidy and William Pepper be appointed a committee from this faculty to confer with the faculty of the Pennsylvania College of Dental Surgery at such time as may be appointed for the purpose."

Respectfully yours,
JAMES TYSON,
Secretary of the Medical Faculty.



Jas. Truman.
L.L.D., DDS.



Chas. J. Essig
DDS.



University of Pennsylvania
Dental Hall.



Edward C. Kirk
D.S., S.C.O.
Dean



Operative Clinic—
Dept. of Dentistry—University of Penna.

After the consideration by the faculties of the Medical department and that of the Pennsylvania College of Dental Surgery, a special meeting of the faculty of this dental school was held on December 27th, at which the question involved was discussed in all its bearings, and a vote being taken resulted in four votes in favor and two against the proposition. The dean of the dental college directed the following letter to the faculty of the medical department of the University of Pennsylvania:

To the Committee appointed by the faculty of the Medical Department of the University of Pennsylvania.

DEAR SIRS:—

The faculty of the Pennsylvania College of Dental Surgery would respectfully state that they have carefully considered the proposition to unite the two institutions. Drs. Essig, Barker, Tyson and Darby would agree to unite under such regulations as might be agreed upon, provided that it could be satisfactorily shown to them that such a union would tend directly to the advancement and good of the dental profession.

Drs. Mears and Buckingham object to the union on the ground that in their opinion such a coalition does not offer or promise any advantage over the teachings of a well-appointed dental college.

CHAS. J. ESSIG, *Dean.*

Drs. Essig, Barker, Tyson and Darby represented the affirmative side of the proposition, but as a unanimous vote of the faculty was needed to bring about the union desired, which could not be obtained, these gentlemen resigned from the dental faculty and at once became interested in the development of the new enterprise. The trustees of the university department, at a meeting held March 6, 1878, decided to establish a dental department of the university, and that this department should be controlled and governed by the dental faculty subject to the general rules made by the board of trustees. It was also decided that the faculty should consist of professors of mechanical dentistry, operative dentistry and dental histology, of anatomy, of physiology, of chemistry, materia medica and of general pathology; and that the professors holding the chairs of anatomy and chemistry, physiology, materia medica and general pathology in the medical department should fill these positions in that of dentistry.

A laboratory building was then planned to be constructed in which the practical dental instruction would be given, and the lectures were to be delivered in the medical hall. Drs. Essig and Darby became the organizers of this department.

Dr. Barker died early in 1878, before it was fully developed, and Dr. Tyson held a position in the medical faculty, of the University of Pennsylvania, while

at the same time holding a chair in the Pennsylvania College of Dental Surgery. The dental department had completed its organization by February 15, 1878, with the following faculty:

CHARLES J. STILLE, LL. D., Provost of the University, Ex-Officio President of the Faculty.

CHARLES J. ESSIG, M. D., D. D. S., Professor of Mechanical Dentistry and Metallurgy.

EDWIN T. DARBY, D. D. S., M. D., Professor of Operative Dentistry, Dental Histology and Dental Pathology.

JOSEPH LEIDY, M. D., LL. D., Professor of Anatomy.

HORATIO C. WOOD, M. D., Professor of Materia Medica, Pharmacy and General Therapeutics.

JAMES TYSON, M. D., Professor of Physiology ad interim.

THEODORE G. WORMLEY, M. D., LL. D., Professor of Chemistry.

MARSHALL H. WEBB, D. D. S., Lecturer on Operative Dentistry.

ROBERT HUEY, D. D. S., Lecturer on Operative Dentistry.

CLINICAL INSTRUCTORS.

DRS. LOUIS JACK, S. H. GUILFORD, H. C. REGISTER, W. R. MILLARD, J. A. WOODWARD, R. H. SHOEMAKER and GEORGE W. KLUMP.

H. C. LONGNECKER, D. D. S., Demonstrator of Operative Dentistry.

H. K. LEECH, D. D. S., Assistant Demonstrator of Operative Dentistry.

WILLIAM DIEHL, D. D. S., Assistant Demonstrator of Operative Dentistry.

A. H. SCHOFIELD, Assistant Demonstrator of Operative Dentistry.

E. C. KIRK, D. D. S., Assistant Demonstrator of Mechanical Dentistry.

ROBERT J. NICKELL, Assistant Demonstrator of Mechanical Dentistry.

H. LENOX HODGE, M. D., Demonstrator of Anatomy.

GRIFFITH E. ABBOTT, PH. D. (Jena), Demonstrator of Practical Chemistry.

Dr. Charles J. Essig became the secretary of the faculty, and he, together with Dr. Tyson and Dr. Darby, formulated the curriculum. On April 1, 1878, its first spring session was held. The trustees of the university were very much in earnest about the proper development of this new enterprise, and proceeded to the erection of a suitable building on the campus of the same.

The first matriculate of this spring session was Edward C. Kirk, a graduate of the last preceding class of the Pennsylvania College of Dental Surgery, who is now (1908) and has been for a number of years past the dean of this department of the university; and the first student who entered in regular course was R. B. Martin of Rocky Mount, La., who graduated with the class of 1881. The matriculates of the first class numbered fifty-three, and at the end of the course, on March 1, 1879, twenty-five were graduated with the degree of Doctor of Dental Surgery: Walter La T. Graves, California; Stephen L. Wiggins,

Canada; Alfred H. Schofield, Connecticut; Henry J. Garrett, Jr., Delaware; George C. Brown, Iowa; Edwin C. Timmerman, Illinois; William J. O'Doherty, Ireland; George H. Van Meter, Italy; Henry C. Aldrich, Minnesota; Lactance A. Brodeur, M. D., Michigan; Wayland W. Hayden, Alfred J. Nims, Massachusetts; Levi W. Johnson, New Jersey; Willoughby D. Miller, Ohio; J. Dorrance Dow, Pennsylvania; Charles G. Joy, Frank Morton Long, William H. Masser, Louis deL. Moss, D. D. S., Robert J. Nickell, John Ramsden, Charles C. Walker, Pennsylvania; Alexander McG. Denham, Scotland; Fritz Hroch, Saxony, and Adolph Wetzol, Switzerland.

At the beginning of the second regular session the new building had been completed, and everything in connection with the conduct of the school assumed an air of permanency. The matriculates of the second class numbered seventy-seven, and the graduates on March 15, 1880, numbered twenty.

At the third annual session there were 110 matriculates and at the end forty-seven were graduated. Dr. Horatio C. Wood retired from the faculty at this time.

A chair of dental therapeutics, materia medica and pathology was instituted this year and Dr. James Truman was, upon the recommendation of the provost of the university, designated as the lecturer upon these subjects. On December 20, 1881, the faculty requested the board of trustees to give the matter concerning female matriculates in the dental department early consideration. At this time it appears a number of women came to this country from Europe with the intention of studying dentistry, and dental schools then not generally admitting women to their classes, the faculty of the university favored their admission and hence asked for permission from the trustees. This action, however, does not appear to have been taken.

The fourth session began with eighty-eight matriculates of whom forty-one graduated at the close.

In the autumn of 1882, Professor Essig resigned the secretaryship, as his private practice demanded more of his time, and on May 22, 1883, Professor James Truman succeeded him.

Seventy-nine matriculates were enrolled at the fifth session, of whom thirty-four graduated.

In 1885, at the suggestion of Professor Truman, the dental department of the university applied for recognition of its diploma to the British General Medical Council. A reply was received from this board and presented at a faculty meeting on February 16, 1886, which conveyed the information that the general medical council declined to recognize the dental qualification of the

University of Pennsylvania. From this time to the present (1908), there had been other arrangements between the parties in interest.

In 1887, a number of female dental students who had been admitted to other schools expressed a desire to complete their course at the University Dental Department. The question was again referred to the provost of the university, Dr. William Pepper, who expressed his views in the case in the following letter:

DEAR PROFESSOR TRUMAN:—

I have carefully considered your note. There is no objection to allowing female students to work in the operating department only, it being understood that they do not become regular students, but are only taking a special course. On the other hand, according to the prevailing views, it would be entirely wrong to admit Mrs. N. or any other woman as a regular student in the department of dentistry.

Yours respectfully,

WILLIAM PEPPER.

At the beginning of the session of 1881, Dr. Ambler Tees became a lecturer on mechanical dentistry, but he occupied that position for only one year. Dr. Marshall H. Webb died on January 1, 1883, having held the lectureship on operative dentistry from the founding of the department. His death was mourned as a serious loss to the dental profession of this country and, as a member of the teaching staff of this department, he had no superior and had no successor of equal skill in his special line of work.

Dr. Harrison Allen resigned the chair of physiology in 1885. Dr. Edward T. Reichert succeeded him.

Dr. Louis Jack, at the beginning of the session of 1886-7, was appointed to succeed the late Dr. Webb as lecturer on operative dentistry, in which he continued for some time. There were no changes until the session of 1889-90, when Dr. George A. Piersol became professor of histology; Edward C. Kirk, lecturer on operative dentistry and John D. Thomas lecturer on nitrous oxide and anesthesia.

June 20, 1889, Dr. James Truman, then secretary, was advanced to the position of dean of the department.

In 1899, Dr. John Marshall became assistant professor of chemistry. The course of instruction was extended from two to three years in the session of 1891-2, and a higher preliminary education was also required. The teaching staff of the university, which had begun with sixteen, had grown to twenty-six by this time. The curriculum of the department had also been enlarged and greater attention was paid to thorough instruction in technics and the associated collateral sciences.

After this had been accomplished, another effort was made to secure recognition abroad, but without securing any change in the previous decision.

In 1894, Norman Sturges Essig became a lecturer on mechanical dentistry and M. L. Rhein, of New York, on dental pathology.

In 1895, the university experienced a great loss in the resignation of Dr. William Pepper as provost. His devotion to the higher interests of the university was almost without precedent. During his administration the university advanced as at no previous period. Buildings were planned and erected, and among these was projected a new building for the dental department. His interest in this branch of study was always active and continued to the last period of his work in the university. The dental building, however, was left for his successor to perfect. The great strain, physical and mental, forced his retirement and the result was manifest in a few years in his death in California and interment in Philadelphia.

From the period of the election of Dr. Pepper as provost, in 1881, to his resignation, in 1894, the progress of the university was shown in the fact that in 1881 the property of the university was estimated at \$1,600,000. In 1894 it was estimated at \$5,000,000. In 1881 it covered fifteen acres and in 1894 it extended to over fifty-two acres.

The resignation of Dr. Pepper made it necessary to elect a new provost and the trustees called one of their number, in 1895, to this position, Charles Custis Harrison. The latter was born in Philadelphia, May 3, 1844, and graduated as Bachelor of Arts at the University of Pennsylvania July, 1862, delivering the Greek salutatory at commencement. He received the degree Master of Arts in 1865. In 1895 he received the honorary degree of Doctor of Laws from Columbia University and the same degree from Princeton University in 1896.

Up to the resignation of Provost Pepper, and for some time thereafter, the professional schools connected with the university enjoyed a certain amount of independence in their management. This autonomy, while in many respects was conducive to their interests, was not regarded as best for the university as a whole, and the centralization of all interests began after the induction to office of Mr. Harrison. This was eventually fully carried out, and necessitated a readjustment of subordinate offices and, with some, limiting the age of incumbents. In the case of the several deans, fifty years was regarded as the limit of valuable service. The old deans, with one exception, either resigned or were retired. In the latter case was James Truman, dean, retired in 1896. He was succeeded by Dr. Edward C. Kirk.

Through Mr. Harrison's efforts the new dental building was prepared for occupancy in September, 1897. This building cost \$129,851.08 and the apparatus and furniture \$26,850.08.

Dr. Kirk, in addition to the office of dean, was made professor of clinical dentistry.

The faculty at the present time, 1908, consists of the following:

EDWIN T. DARBY, D. D. S., M. D., Professor of Operative Dentistry and Dental Histology.

JAMES TRUMAN, D. D. S., LL. D., Professor of Dental Pathology, Therapeutics and Materia Medica.

EDWARD T. REICHERT, M. D., Professor of Physiology.

GEORGE A. PIERSOL, M. D., Sc. D., Professor of Anatomy.

JOHN MARSHALL, M. D., NAT. SC. D., Professor of Chemistry and Toxicology.

EDWARD C. KIRK, D. D. S., Sc. D., Professor of Clinical Dentistry.

ALEXANDER C. ABBOTT, M. D., Sc. D., Professor of Bacteriology.

MATTHEW H. CRYER, D. D. S., M. D., Professor of Oral Surgery.

CHARLES R. TURNER, D. D. S., M. D., Professor of Mechanical Dentistry and Metallurgy.

GEORGE G. MILLIKEN, D. D. S., M. D., Assistant Professor of Operative Technics.

DAVID H. BERGEY, A. M., M. D., Assistant Professor of Bacteriology.

R. HAMILL D. SWING, D. D. S., Assistant Professor of Oral Surgery and Anæsthesia.

A. DEWITT GRITMAN, D. D. S., Assistant Professor of Mechanical Dentistry.

FREDERIC A. PEESO, D. D. S., Assistant Professor of Crown and Bridge Work.

In addition to these the following lecturers fill the following positions:

DR. ROBERT HUEY, D. D. S., Lecturer on Operative Dentistry.

DR. JOHN D. THOMAS, D. D. S., Lecturer on Nitrous Oxide.

MEYER L. RHEIN, D. D. S., M. D., Lecturer on Dental Pathology.

SAFFORD G. PERRY, D. D. S., Lecturer on Operative Dentistry.

ALFRED P. LEE, D. D. S., Lecturer on Materia Medica.

WILLIAM A. CAPON, D. D. S., Lecturer and Special Instructor in Porcelain Work.

The demonstrators covering the various branches taught number thirty and, in addition, there are four clinical instructors.

The number of graduates now (1908) is 2,291.

In 1907, John A. Reimold, on his twenty-fifth year of service, was made registrar of the department.

The number of students in 1907-08, including fifteen specials, was 390. Of this number 107 are from countries outside the United States. These include England, France, Ireland, Scotland, Switzerland, Holland, Australia, New Zealand, Russia, Cuba, West Indies, Canada, Nicaragua, Central America, Brazil, Chili, Germany, Argentine Republic, Colombia, Peru, Costa Rica, Ecuador, Italy, Portugal and British Columbia.

INDIANA DENTAL COLLEGE.

INDIANAPOLIS, IND.

BY GEORGE EDWIN HUNT, M. D., D. D. S.

The Indiana Dental College was born of necessity. Probably no other existing college has a better reason for being. In the winter of 1878-1879, the first effort was made by the dentists of Indiana to secure legislation creating a state board of dental examiners. Prior to that time, as was the case in most states, there were no legal restrictions surrounding the practice of dentistry and most practitioners entered the profession after spending a greater or less length of time as "assistant" in the office of a "preceptor." The State Dental Association committee, appointed to secure the desired legislation, met with the usual obstacles and rebuffs that seem inevitable in the enactment of laws benefiting the entire people, and was finally confronted, in committee, with the contention that a law such as they desired would compel Indiana citizens to go out of the state to secure a dental education. This objection was met with the pledge that a dental college would be established if the legislature would pass the bill. On this pledge, the first dental law of Indiana was enacted by the legislature.

Under date of May 20, 1879, a circular was sent to every dentist in Indiana, inviting them to meet in Indianapolis, June 23, 1879, to form a dental college association and to determine the manner of establishing and conducting such an institution. This circular was signed by a committee composed of Phineas G. C. Hunt and J. E. Cravens. The meeting was duly held and after discussion, a committee was appointed to draft articles of association. At another meeting, held June 26, 1879, these articles were adopted and the following board of trustees was elected: W. L. Heiskell, President; M. H. Chappel, Vice-President; J. E. Cravens, Secretary; Merit Wells, Treasurer; P. G. C. Hunt, S. T. Kirk, S. M. Goode, W. M. Herriott, F. Hutchinson. Dr. P. G. C. Hunt was elected dean of the faculty. In this manner, through the demand of a legislative committee, the Indiana Dental College had its inception.

At this time there were only eight other dental colleges in existence and one of these, the department of dentistry of the University of Pennsylvania, had just completed its first term of teaching. West of the Alleghany Mountains but three dental colleges had been established—the Ohio College of Dental Surgery first opening its doors in 1845, to be followed by the Missouri Dental College in 1866, and the dental department of the University of Michigan in 1875.

During the first session the students of the Indiana Dental College took their lectures and laboratory work in anatomy, physiology, chemistry and materia medica with the students of the Medical College of Indiana. As there were but six students that first year, it did not materially discommode the medical college faculty. The session opened October 1, 1879, the college occupying eight rooms in the Thorpe block, 147 East Market street, for which it



paid a monthly rental of \$20.84. The total disbursements during this session amounted to \$734.64. Three candidates were graduated, namely, Robert W. VanValzah, Terre Haute, Ind.; William E. Swigert, New London, Mo.; Edward J. Church, Laporte, Ind.

For a year or two the college operated under the following rules:

Five years of reputable practice and a satisfactory preliminary examination, before the faculty, on practical dentistry shall be necessary to admit a practitioner to the privileges of the senior or graduating class and be considered equivalent to one course of lectures and demonstrations, known as the junior course.

Two years' pupilage under a competent practitioner and a satisfactory preliminary

examination upon the various branches taught by the faculty shall entitle the students to enter the senior or graduating class.

Two years' pupilage under a competent practitioner shall admit a student to the junior class.

Each student was required to show he possessed a good common school education.

The first two sessions of five months each were held in the rooms originally leased in the Thorpe block, but April 1, 1881, the college leased the third and fourth floors of the Aetna block, corner of Court and Pennsylvania streets, a half block north of Washington street, where it remained many years. There being ample room here, the college established its own laboratories for chemistry and dissecting, and ever since the college has taught all branches of the curriculum under its own roof.

When the college was established it was believed it would draw its students almost exclusively from Indiana, but this was early proven to be an erroneous deduction, for of the ten graduates of the second year, two were from far-off Mississippi, one from Michigan, one from New York, one from Wisconsin, one from Illinois and four from Indiana.

The first professor of mechanical dentistry was Dr. Joseph Richardson, then a resident of Terre Haute, author of Richardson's Mechanical Dentistry, which was for many years the standard text-book on that subject. Dr. Thomas S. Hacker, of Indianapolis, was Dr. Richardson's assistant and subsequently succeeded him in the professorship. Dr. Junius E. Cravens had the chair of operative dentistry. Dr. Henry Jameson, now and for several years past dean of the Indiana Medical College, occupied the chair of chemistry for two sessions, being succeeded in the fall of 1881 by Dr. John N. Hurty, who still fills it. Dr. Hurty is secretary of the Indiana Board of Health, was sanitary expert for the Louisiana Purchase Exposition held at St. Louis in 1904, and sanitary advisor for the Jamestown Exposition, held at Jamestown in 1907.

At the close of the third session, in March, 1882, Drs. P. G. C. Hunt and W. M. Herriott were elected president and vice president, respectively, of the board of trustees, Drs. Cravens and Wells again being elected secretary and treasurer. Dr. Herriott not desiring to serve, Dr. M. H. Chappell was elected vice president at a later meeting.

Dr. P. G. C. Hunt, having been president of the state board of dental examiners since its organization, felt that he should not also be president of the college. So, in May, 1882, he resigned from the board of trustees and from the faculty, Dr. W. L. Heiskell again being elected president of the board.

From then until 1899 the faculty had no dean, the secretary of the board of trustees acting in that capacity.

For many years the college pursued the even tenor of its way, gradually increasing the number of students in attendance and strengthening its faculty. In the summer of 1887, it became a member of the National Association of Dental Faculties, at the fourth annual meeting of that body.

Beginning with the session which opened in October, 1890, a three years' course was adopted. Two years later a seven months' session was adopted. The session of 1894-1895 was held in the new college building, at the corner of Ohio and Delaware streets, the rented quarters in the Aetna block proving inadequate for the growing school.

In the spring of 1895, Dr. P. G. C. Hunt was elected president of the board of trustees and Dr. George E. Hunt was elected secretary. Dr. P. G. C. Hunt superseded Dr. Seneca B. Brown of Fort Wayne, Ind., who had been president for several years, and Dr. George E. Hunt followed Dr. J. E. Cravens, who, with Dr. John N. Hurty, had served as secretary for some sessions. Upon the death of Dr. P. G. C. Hunt, in April, 1896, Dr. J. N. Hurty was elected president of the board. In the spring of 1899 the office of dean, unfilled since the resignation of Dr. P. G. C. Hunt, in 1882, was revived and Dr. George E. Hunt was elected to fill the office.

✕ The Indiana Dental College has about eleven hundred graduates practicing practically all over the civilized world. Its students are today practicing in Canada, England, Germany, Persia, Korea, Japan, Brazil, Alaska, Cuba, China, India, the Philippine Islands and nearly all the states of the United States. When the contract army corps was organized, Dr. Robert Todd Oliver, of the class of 1888, was appointed by Surgeon-General Sternberg as one of the supervising and examining board. Dr. Oliver acted as secretary of the board and attended to the great detail connected with its organization. The other two original members of the board were Dr. John S. Marshall, a medical graduate but without a dental degree, and Dr. Robert W. Morgan, of Lynchburg, Va. On the retirement of Dr. Morgan, after a short service, Dr. John W. Hess, of the class of 1890, Indiana Dental College, was appointed a member of the examining board, this giving the Indiana Dental College the only two dental college graduates of the three members of the board.

In the latter part of 1894, the "Dental Brief," a monthly dental magazine published in Philadelphia, offered three prizes for the best three essays on a dental subject submitted by a senior student in a dental college. The essays were judged by three well-known dentists, none of whom knew the names of the

writers nor the college they were attending. That year, Harry Hunter, from Missouli, India, a member of the class of 1905, Indiana Dental College, with an essay on "Oral Prophylaxis," won second prize. The following year the "Brief" renewed its offer and the essay on "Heredity," submitted by Howard R. Raper, of the class of 1906, was awarded first prize.

At present (1908) the faculty consists as follows:

ROBERT TODD OLIVER, D. D. S., Examining and Supervising Dental Surgeon, U. S. Army, Emeritus Professor of Oral Surgery.

GEORGE EDWIN HUNT, M. D., D. D. S., Dean, Professor of Operative Dentistry, Oral Hygiene, Dental Therapeutics and Pathology.

JOHN N. HURTY, M. D., Phar. G., Secretary State Board of Health, Professor of Chemistry and Metallurgy.

JOHN Q. BYRAM, D. D. S., Professor of Prosthetic Dentistry, Crown and Bridge Work, Porcelain Work and Dental Technics.

CHARLES R. JACKSON, D. D. S., Phar. G., Professor of Orthodontia.

CARL D. LUCAS, D. D. S., Professor of Dental Anatomy, Histology and Embryology.

EDGAR F. SOMMER, M. D., Professor of Anatomy.

FRANK A. MORRISON, M. D., Professor of Physiology and Histology.

FRANK B. WYNN, A. M., M. D., Professor of Medical Diagnosis.

ROSCOE H. RITTER, M. D., Professor of Materia Medica and Therapeutics.

CHARLES A. PFAFFLIN, M. D., D. D. S., Professor of General and Oral Surgery.

WILLIAM T. S. DODDS, M. D., Professor of Bacteriology.

E. RAY KIBLER, D. D. S., Lecturer on Clinical Anæsthesia and Extracting.

CHARLES R. JACKSON, D. D. S., Phar. G., Lecturer on Dental Physics and Demonstrator in charge of the Chemical and Physical Laboratories.

HARRY K. LANGDON, M. D., in Charge of Bacteriological, Histological and Pathological Laboratories.

JOHN T. WHEELER, M. D., Assistant to the Chair of Anatomy.

LEWIS B. EWBANK, LL. D., Lecturer on Dental Jurisprudence.

ALICE HARVIE DUDEN, D. D. S., Lecturer on and Demonstrator of Oral Prophylaxis.

W. DILLON HACKER, D. D. S., Assistant to the Chair of Technic.

HOWARD R. RAPER, D. D. S., Assistant to the Chair of Technic.

CHARLES R. JACKSON, D. D. S., Phar. G., Superintendent of Clinical Dentistry.

VANDERBILT UNIVERSITY, DEPARTMENT OF DENTISTRY.

NASHVILLE, TENN.

BY D. R. STUBBLEFIELD, A. M., M. D., D. D. S.

In 1879, Dr. W. H. Morgan, at the request of Bishop H. N. McTyeire, was given the task of associating a body of teachers and formulating a course of instruction suitable for a department of Vanderbilt University. The man who

was selected by Commodore Vanderbilt to found a great institution of learning never did a wiser act than when he put the creation of the new department in the hands of William H. Morgan. Of all the dentists in the south, Dr. Morgan ranked with, if not as, the best, from many viewpoints. He had a better professional education than most at that day had, or thought it necessary to ac-



quire. In addition to his unusual professional equipment, he had cherished a desire for years to institute such a school and had, therefore, a definite idea, which had been worked over in his mind until it was single, strong, suitable. To get the best out of the other two qualities, he was a man of solid mind, slow to conclude until he had thoroughly threshed out all the facts, and then he had the courage of his convictions to an unusual degree. His fitness for founding a professional school was so well-rounded that the distinguished man who fortunately selected him added to his own character for wisdom in picking him out.

From years of confidential association with him, the story of his early and

ambitious desires to found a place where the youth of the land might acquire a practical course worthy of the future which his prescient soul believed in store for dentistry, was learned. He was wont to tell of the offers made him by friends interested in teaching medicine, to give him an opportunity with them to try out his well-conceived plans of dental education. But he saw clearly, and scorned with an inexpressible contempt, the small idea they had of the profession he so exalted in his own mind, and, time and again, he refused their offers. The best or none, was not often expressed by him, but was always the basis of his actions.

Finally, after twenty-one years of prenatal preparation, as it were, his confidence was justified by an opportunity which came to him unsought to choose a faculty and fashion a course of instruction that would as nearly as possible carry out his ideas. The immediate success that crowned his efforts fully proved the need of such a school in his locality, the maturity of his plans and the wisdom manifested in the selection of him for the work. This prompt success, it is thought further, was greatly due to the fact that nothing had been left to chance, for everything had been maturely considered and the wisest judgment exercised.

The members of the first faculty were:

L. C. GARLAND, LL. D., Chancellor.

W. H. MORGAN, M. D., D. D. S., Dean; Clinical Dentistry and Dental pathology.

N. T. LUPTON, LL. D., Chemistry and Metallurgy.

J. C. ROSS, D. D. S., Operative Dentistry and Dental Hygiene.

R. R. FREEMAN, M. D., D. D. S., Secretary Mechanical and Corrective Dentistry.

T. A. ATCHISON, M. D., Materia Medica and Special Therapeutics.

J. R. BUIST, M. D., Oral Surgery and Surgical Pathology.

R. M. STEGAR, M. D., Practical Chemistry and Microscopy.

D. R. STUBBLEFIELD, A. B., M. D., Anatomy and Physiology.

HENRY W. MORGAN, M. D., D. D. S., Assistant in Operative Dentistry.

The first year's work began in October of the same year in rooms specially prepared on the third floor of a building on the corner of Sixth avenue, South street and Broadway. The length of the session was five months and only two years were required of applicants for the degree, which was fully abreast of the times.

The growth of the school was so immediate and rapid that in 1889, ten years after commencing, demands were made upon the university for more space and enlarged facilities for work. The result was that a large and handsome building, known as the dental and law building of Vanderbilt University,

was erected on Fourth Avenue, North, in which four commodious floors were devoted to the department of dentistry. At that time it seemed the work could never grow beyond the spacious quarters occupied. But the school seemed to feel the added dignity and rapidly grew to fill even these floors, and, in 1899, had overflowed into the part set off for the law department and public offices. Again the department of dentistry was too large for its halls.

The course of two sessions (five months each) had also met the rising demand of the profession, and had grown into three sessions of six months, and then of thirty weeks each. The quality of the work had also grown. Laboratory instruction in all departments of scientific research was instituted. This reached its highest practical utility in the perfection of technic, which might be denominated the bloom of dental instruction in the last decade, and in which this department takes growing pride in being the pioneer in the south.

When it was seen that the department of dentistry had outgrown the building it occupied, especially in the need of laboratory room, the university determined upon a new building. Price's college was bought, and the original building facing on Ninth avenue, South, was set apart for the use of the department of dentistry. The building was readjusted to meet the requirements by the addition of a new sixth floor, which gave the space necessary for everything taught in an up-to-date dental school. There are four lecture halls, a surgical operatory, a technic demonstrating room and rooms for chemical and bacteriological laboratories. On the sixth floor, reached by an electric elevator, are situated the rooms especially designed for the practical features of the course, consisting of operatory, three laboratories and extracting and impression rooms. This floor is practically a pavilion floor, since the large windows are separated only by steel columns, and, therefore, the perfect lighting of all parts is assured. This convenient assembly of all practical features is not only unusual, but unique, and much is claimed for it. In this building also are enough suitable rooms for the establishment of a dormitory accommodating about eighty students. A dining room, a Young Men's Christian Association room, a library and a museum are also included.

Realizing that, after all, the measure of a dentist is his knowledge of the practical operations of his profession, this department has always strenuously dwelt upon practical training. In accordance with its past history, the dental operatory has been made the central feature of the new home. Its position for light, ventilation and quiet cannot be surpassed, as it has windows on three sides and skylight above. The floor measures seventy-two by fifty-two feet, giving space for more than seventy-five dental chairs, and is subdivided in the

actual work so that each department will be assembled in one portion of the room. On the north, east and south exposures the dental chairs will be regularly placed around a full equipment of open marble washstands, supplying both hot and cold water. Near the door of entrance are the secretary's office and examining room and seats for waiting patients. Opening out of this room is the extracting room. The equipment of this operatory is new, elegant and suited for the best work.

To the west of the operatory, beyond the elevator hall, are the laboratories for all three classes, fully equipped for all appliances for technic instruction and senior demonstrations. Waterproof floors for the plaster and impression rooms, electric power for the lathes of all three laboratories, and many modern conveniences for instructors and students, especially lockers numbered and fitted for individual use, make these rooms almost ideal for the work which they represent.

The department also operates a dining hall in connection with the dormitory. All rooms in the dormitory have electric light and steam heat and both shower and tub baths are supplied to the students of the dormitory. The building throughout is supplied with electric light and steam heat.

The present faculty of the department of dentistry (1908) is as follows:

JAMES K. KIRKLAND, A. M., PH. D., LL. D., Chancellor.

D. R. STUBBLEFIELD, A. M., M. D., D. D. S., Dean; Professor of Hygiene, Oral Prophylaxis and Metallurgy.

HENRY W. MORGAN, M. D., D. D. S., Professor of Operative Dentistry.

JOSEPH P. GRAY, M. D., D. D. S., Secretary; Professor of Prosthetic Dentistry.

J. ATCHISON DALE, D. D. S., Professor of Crown and Bridge Work and Lecturer on Prosthetic Dentistry.

L. G. NOEL, M. D., D. D. S., Professor of Clinical Dentistry and Physical Diagnosis.

R. BOYD BOGLE, M. D., D. D. S., Professor of Orthodontia and Anæsthesia.

D. M. CATTELL, D. D. S., Professor of Dental Anatomy and Operative Technic, and Superintendent of Demonstration; Lecturer on Dental Jurisprudence.

W. A. BRYAN, A. M., M. D., Professor of General and Oral Surgery.

OLIN WEST, M. D., Professor of Chemistry.

Y. W. HALEY, M. D., Professor of Physiology, Materia Medica, and Therapeutics.

HARRINGTON MARR, M. D., Professor of Anatomy.

WILLIAM LITTERER, JR., A. M., PH. C., M. D., Professor of Histology, Bacteriology and Pathology.

W. C. GILLESPIE, D. D. S., Lecturer on Porcelain.

JAMES W. WINN, Assistant to Chair of Clinical Dentistry.

Demonstrators: M. W. MOORES, D. D. S., JOHN A. PERKINS, D. D. S., NEWTON HARRIS, D. D. S.

Directors of Laboratories, Chemical: OLIN WEST, M. D., Histological and Pathological: WILLIAM LITTERER, JR., A. M., PH. C., M. D.; Practical Anatomy: HARRINGTON MARR, M. D.

KANSAS CITY DENTAL COLLEGE.

KANSAS CITY, MO.

BY J. D. PATTERSON, D. D. S.

The Kansas City Dental College was organized in 1881 as the dental department of the Kansas City Medical College.

Foremost in the establishment of this school was Dr. R. I. Pearson, a zealous man who had retired from practice. Dr. Pearson, with Drs. Stark, Hungerford, Hewitt, Patterson and others, realizing that in the future Kansas City was destined to yield an increasing influence in professional fields, and that eventually it would be the center for a wide area in educational efforts, determined to organize a dental college upon the best standards, with the best men of the west, and to sustain vigorously the very highest reputation. At that time it seemed wise to ally the college with the Kansas City Medical College, which was the medical college par excellence of the west, and this was accordingly accomplished.

In 1890 the officers, deeming it best that dental education should be followed independent of affiliation with a medical college, purchased the franchise of the Kansas City Dental College, and since that time the college has taught dental science strictly, and has secured an enviable reputation for the preparation of young men for the practice of their profession. During the twenty-eight years of its existence there have been, of necessity, changes in the faculty; notwithstanding this, the year 1904 found four of the original faculty still active as teachers, viz.: W. T. Stark, C. L. Hungerford, J. D. Patterson and J. D. Griffith.

The present officers of the Kansas City Dental College are as follows: Dean, J. D. Patterson, D. D. S.; Secretary, Charles Channing Allen, D. D. S.; Executive Committee—W. T. Stark, D. D. S., C. C. Allen, D. D. S., J. D. Patterson, D. D. S.

The following compose the 1908 faculty:

J. D. PATTERSON, D. D. S., President, Professor of Dental Pathology.

W. T. STARK, D. D. S., Professor of Prosthetic Dentistry.

J. D. GRIFFITH, M. D., Professor of Clinical and Oral Surgery.

FREDUS N. PETERS, PH. D., Professor of Chemistry and Physics.

J. H. LANING, M. D., Professor of Anatomy.

E. L. STEWART, M. D., Professor of Histology and Bacteriology.

ALTON H. THOMPSON, D. D. S., Professor of Human and Comparative Odontology.

SAMUEL LOEBENSTEIN, D. D. S., Professor of Anaesthesia.

E. L. CHAMBLISS, M. D., Professor of Materia Medica and Therapeutics.
 OLIVER P. FAIRES, M. D., Professor of Physiology and Hygiene.
 CHARLES L. HUNGERFORD, D. D. S., Professor of Operative Dentistry.
 J. H. LANING, M. D., Demonstrator of Anatomy.
 J. G. HOLLINGSWORTH, Resident Demonstrator.
 CHARLES CHANNING ALLEN, D. D. S., Demonstrator.
 DAYTON DUNBAR CAMPBELL, D. D. S., Instructor in Technics.

CLINICAL DEMONSTRATORS.

C. B. Reed, D. D. S.; R. M. Seibel, D. D. S.; F. P. Cronkite, D. D. S.; W. A. Moore, D. D. S.; S. J. Renz, D. D. S., A. J. McDonald, D. D. S.; G. A. Esterly, D. D. S.; W. J. O'Bryon, D. D. S.; A. E. Gossard, D. D. S.

The college owns its building on the corner of Troost avenue and Tenth street, and in the near future will erect another building to accommodate the growth of the institution. Its graduates number 600 and are scattered over the entire world.

The college is an original member of the National Association of Dental Faculties, and has always been active in furthering the interests of dental education.

UNIVERSITY OF MARYLAND, DENTAL DEPARTMENT.

BALTIMORE, MD.

BY FERDINAND J. S. GORGAS, A. M., M. D., D. D. S.

The period directly following the great struggle for liberty in this country was distinguished by the organization of professional schools in medicine, law and theology. To this period the University of Maryland traces its origin. The act of establishing a medical school in Maryland originated with Dr. John Beale Davidge, an eminent physician, as early as 1796, who, supported by Dr. Nathaniel Potter and other prominent men, instituted courses of medical lectures which were delivered annually until 1807, when the Board of regents and the faculty obtained a charter from the legislature of the state of Maryland.

In 1807, the construction of the present university building, an imitation of the pantheon at Rome, was begun. In this year the legislature passed an act

authorizing the medical school to annex to itself a school of law, divinity, and arts and sciences, naming the same the University of Maryland.

The Hon. Robert Smith became the first provost of the university, he had previously been secretary of state of the United States. The honorary degree of L. L. D. was bestowed by this university upon General Lafayette during his last visit to this country on October 24, 1824. It is said to have been the first degree of the kind ever to have been conferred by an American university.

In 1882, following the example of Harvard University, the University of Pennsylvania and other like institutions, the dental school was chartered as a department of this university by the legislature of the state. A building especially for its use was erected during that year, which, after having been added to four different times, was finally torn down to make room for the building now occupied by this school, which was erected in 1904.

The first session of this department opened with over sixty students, later classes having steadily increased in numbers.

The first dental lectures in an educational institution in the United States were delivered in the University of Maryland in 1821-2, and, in 1837, a regular course of dental lectures was delivered to the medical classes by Dr. Horace H. Hayden. It is claimed, therefore, that the University of Maryland was the first to give instruction in dentistry.

The first faculty of this dental department, in 1882 consisted of:

FERDINAND J. S. GORGAS, A. M., M. D., D. D. S., Dean, Professor of Principles of Dental Science, Oral Surgery and Dental Prosthesis.

JAMES H. HARRIS, M. D., D. D. S., Professor of Operative and Clinical Dentistry.

WILLIAM E. A. AIKEN, M. D., LL. D., Professor of Chemistry.

SAMUEL C. CHEW, A. M., M. D., Professor of Materia Medica and Therapeutics.

FRANCIS T. MILES, A. M., M. D., Professor of Physiology.

L. McLANE TIFFANY, A. M., M. D., Clinical Professor of Surgery.

J. EDWIN MICHAEL, A. M., M. D., Professor of Anatomy.

JOHN C. UHLER, M. D., D. D. S., Demonstrator of Prosthetic Dentistry.

FRANK L. HARRIS, D. D. S., and LEWIS M. COWARDIN, D. D. S., Demonstrators of Operative Dentistry.

RANDOLPH WINSLOW, A. M., M. D., Demonstrator of Anatomy.

The dental students, while receiving their special dental lectures and attending dental clinics and infirmary and laboratory practice under special dental teachers, take the same lectures under the same instructors as the medical students in anatomy, chemistry, physiology, materia medica and therapeutics. They are also admitted to all of the surgical clinics of the medical school.

The dental faculty at present (1908) consists of the following:

FERDINAND J. S. GORGAS, A. M., M. D., D. D. S., Professor of Principles of Dental Science, Oral Surgery and Dental Prosthesis. Dean.

JAMES H. HARRIS, M. D., D. D. S., Professor of Operative and Clinical Dentistry.

R. DORSEY COALE, A. M., PH. D., Professor of Chemistry and Metallurgy.

RANDOLPH WINSLOW, A. M., M. D., Clinical Professor of Oral Surgery.

J. HOLMES SMITH, A. M., M. D., Professor of Anatomy.

JOHN C. HEMMETER, M. D., PH. D., LL. D., Professor of Physiology.

TIMOTHY O. HEATWOLE, M. D., D. D. S., Professor of Dental Materia Medica and Therapeutics.

JOHN C. UHLER, M. D., D. D. S., Associate Professor of Prosthetic Dentistry.

ISAAC H. DAVIS, M. D., D. D. S., Professor of Clinical Dentistry and Orthodontia.

J. S. GEISER, D. D. S., Demonstrator of Operative Technics.

HOWARD EASTMAN, D. D. S., Demonstrator of Prosthetic Technics.

L. WHITING FARINHOLT, D. D. S., Demonstrator of Crown-Bridge and Porcelain Inlay Work.

CLYDE V. MATTHEWS, D. D. S., Demonstrator of Anaesthesia.

WILLIAM A. REA, D. D. S., Demonstrator of Operative Dentistry.

DENTAL COLLEGE OF THE UNIVERSITY OF CALIFORNIA.

SAN FRANCISCO, CAL.

BY W. F. SHARP, D. D. S., D. M. D.

The College of Dentistry of the University of California owes its existence to the medical department of the same institution, inasmuch as it was upon the recommendation of the latter on May 28, 1881, that the regents created the dental department as an integral part of the state university. The first session was held in 1882. It, therefore, is in the twenty-sixth year of its life.

While the undergraduate departments of the university are clustered at Berkeley across the bay, the professional colleges are, for convenience of clinical study, conducted in the city of San Francisco, where there is an abundance of available and interesting material.

Through the courtesies and liberal offer of the faculty of the medical department, the dental department was first given space, and located in Toland hall, in San Francisco, at North Beach, on Stockton street near Chestnut street, in a fine brick structure overlooking the bay, then entirely devoted to medical instruction.



J.G. SHARP, DEAN
D.D.S.M.D.

UNIVERSITY of CALIFORNIA
DENTAL DEPT.
COLLEGE BLDG.



E.L. DUNBAR
D.D.S.



C.L. GODDARD
D.D.S.

The classes of the two departments were held together, so far as the Medical courses which were a part of the curriculum of both were concerned, and this association continued until 1891, by which time they had outgrown the space they occupied, so the dental department changed its quarters, and moved to the top floor of the Donohue building, which was then located in the heart of the city. A few years later the state provided for, and erected buildings at an outlay of a quarter of a million dollars, upon ground generously donated by the late Adolph Sutro, to house the different professional colleges of the university, and, in 1900, they were ready for occupancy, but owing to it being out some distance from the thickly settled district of the city, upon which the infirmary had to depend for the clinical advantages, only the laboratory and scientific work was conducted there, and the infirmary continued at the old quarters, until the now historical earthquake and conflagration had worked the destruction of the greater part of San Francisco, including this part of the dental college. Following this, it at first looked hopeless, but due to a sound insurance company, a generous legislature, and the earnest effort of all of the faculty, it was quickly re-established, with a complete equipment, and all modern improvements for dental education, in its own building, one of the group located on Parnassus Heights, beautifully situated overlooking the city, the famous Golden Gate park, and harbor of San Francisco.

The faculty of the college has nothing to do with the financial side of conducting the department, except to suggest or make recommendations to the university regents in whose hands the matter of expenditures entirely rests, and as no financial aid or support for current expenses is given by the state, they have to depend upon the fees, for providing equipment and maintaining the college courses. The greater part of the instructing staff are salaried officers, excepting the dental members of the faculty who constitute the executive body and who for years past have given their time and services without compensation.

There are 23,000 square feet of space devoted exclusively to its own use and distributed about equally in four floors; the chemical and metallurgical laboratories, students, janitors, lockers, furnace and store rooms being on the ground floor; infirmary, impression, orthodontia, surgical, preparation, office rooms, senior and junior prosthetic, and porcelain laboratories on the second floor; the third floor is devoted to the pathological, histological and physiological laboratories and dental technic rooms; while the fourth is occupied by lecture and class rooms, museum, library and faculty rooms.

The personnel of the faculty has of course undergone many changes, but in its long life of over a quarter of a century it has been conducted under the deanship of but five different men; namely, Drs. S. W. Dennis, C. L. Goddard, L. L. Dunbar, H. P. Carlton and James G. Sharp.

A number of the professors and instructors have shown a faithfulness and an earnestness by giving a continuous service in the Department for a period actually covering or approaching a couple of decades and of these might be mentioned Drs. C. L. Goddard, M. J. Sullivan, L. L. Dunbar, A. A. D'Ancona, W. B. Lewitt, H. P. Carlton, W. F. Sharp, J. D. Hodgen and J. G. Sharp, which is a fair showing of men who have made a personal sacrifice of their time and energy in the interest of dental education.

It is claimed for the college that it has always maintained a high standard and at all times have its requirements been in advance of the demands of the National Association of Dental Faculties. It was the second dental college in the United States to adopt a nine months' school term, which it has ever since adhered to; and it was the third to require a preliminary examination for admission, or rather to state the nature of that examination; and it was also the third college to require three years' study before graduation.

The college in its efforts to maintain the highest standards in dental education, urged and has been instrumental in organizing the Dental Faculties Association of American Universities, whose sole object is to promote higher standards in dental education and science.

The Association is based upon the standards and requirements of the Association of American Universities, which standards, it is hoped will guarantee to the world the real intent of its members and by its work will merit the recognition it deserves.

In connection with the college there is an active alumni association, the membership being open to all of its graduates, who in all have numbered about seven hundred.

The dental infirmary is supplying a great want in the community, as the field is large and there is a crying need for its existence.

Its benefits are intended only for the needy, but owing to the expensive materials necessary for a large proportion of dental work, it is forced to exact a fee for a good part of the work, but in all instances it is only intended to cover cost of materials, wear and tear and operating expenses.

It is fitted with the most improved appliances and includes forty Wilkin-

son and Columbia operating chairs and Clark's fountain cuspidors, swinging brackets, glass top enameled tables, and instrument cabinets at each chair.

The following list constitutes the present (1908) instructing staff of the college:

FACULTY.

BENJAMIN IDE WHEELER, Ph. D., LL. D., President of the University and ex-officio President of the Faculty.

LUIS LANE DUNBAR, D. D. S., Professor of Operative Dentistry and Dental Pathology, Emeritus.

JAMES G. SHARP, M. D., D. D. S., Professor of the Principles and Practice of Surgery, and Dean.

WILLIAM F. SHARP, D. D. S., D. M. D., Professor of Prosthetic Dentistry.

JOSEPH D. HODGEN, D. D. S., Professor of Operative Dentistry.

JOHN B. TUFTS, D. D. S., Professor of Orthodontia.

GEORGE L. BEAN, D. D. S., Professor of Dental Porcelain.

SAMUEL S. MAXWELL, M. S., Ph. D., Asst. Professor of Physiology.

IRVING HARDESTY, A. B., Ph. D., Associate Professor of Anatomy and Histology.

GUY S. MILLBERRY, D. D. S., Acting Professor of Chemistry and Metallurgy and Superintendent.

LECTURERS AND INSTRUCTORS.

HENRY B. CAREY, B. S., M. D., Instructor of Materia Medica and Therapeutics, and Anatomy and Histology.

AUGUST J. LARTIGAU, M. D., Instructor in Bacteriology and Pathology.

EDWIN H. MAUK, D. D. S., Instructor in Dental Technics.

ADOLPH BAER, B. L., B. S., M. D., D. D. S., Special Lecturer on Embryology and Diseases of the Mouth, Face and Jaws.

ROBT. DUNN, D. D. S., Instructor of Orthodontia.

ROSCOE A. DAY, D. D. S., Instructor in Orthodontia Technic.

ADAM A. SOLLEY, D. D. S., Clinical Demonstrator of Orthodontia.

LOUIS BARTLETT, Ph. B., LL. B., Special Lecturer on Dental Jurisprudence.

OTTO P. ROLLER, D. D. S., Special Instructor in Dental Porcelain.

HERBERT T. MOORE, B. S., D. D. S., Lecturer on Principles and Practice of Surgery.

SHERRELL W. HALL, D. D. S., Clinical Instructor in Extracting.

LOUIS GRAHAM, D. D. S., Assistant to the Chair of Operative Dentistry.

WALTER J. CURRIDGE, D. D. S., Clinical Instructor in Crown and Bridge Work.

GEO. T. MCDANIEL, D. D. S., Laboratory Instructor in Chemistry.

JOHN E. GURLEY, D. D. S., Laboratory Assistant in Chemistry.

DEMONSTRATORS AND ASSISTANT INSTRUCTORS.

R. FRANKLIN WEST, D. D. S.; FRIEND B. KENWARD, D. D. S.; JOHN P. NEU, D. D. S.; HENRY M. ELBERG, D. D. S.; SEYMOUR C. DAVIS, D. D. S.; ELMER E. EVANS, D. D. S.; LEIGHTON C. BROWNTON, D. D. S.; M. THAYER RHODES, D. D. S.; BEVERLY B. HOOK, D. D. S.

STATE UNIVERSITY OF IOWA COLLEGE OF DENTISTRY.

IOWA CITY.

BY W. S. HOSFORD, B. A., D. D. S.

The college of dentistry of the State University of Iowa was first called the dental department and was organized in 1881, in response to an earnest request from representatives of the dental profession throughout the state, acting through the Iowa State Dental Society.

The first session was held during the year 1882-3. The college is a component part of the university and is located on the same campus with the other colleges. This gives the student, the advantage of instruction in other departments and the use of the laboratories, libraries and museums of the whole university, as well as acquaintance and close relations with the faculties and students of the several colleges of the institution.

The course in dentistry extends through three years of thirty-six weeks each. The method of instruction is by lectures, demonstrations, recitations and the actual performance of both laboratory and clinical work by the student himself under the supervision of demonstrators. A systematic and thorough preliminary training is given through the technical work of the laboratories, fitting the student as far as possible for the practical work of the infirmary.

The hall of dentistry is a large and modern stone-trimmed, brick building devoted exclusively to the use of the college of dentistry. The building is well lighted throughout and free from dust and smoke. The laboratories have a large window at each table with lockers beneath for instruments. These laboratories have all the usual appliances, including electric lathes for polishing.

The lecture rooms are ample and seated with comfortable opera chairs.

The operating rooms are exceptionally well lighted, and are provided with modern dental chairs, each having a fountain spittoon with saliva ejector and a cabinet for instruments. Each chair is also provided with an overhead electric light.

Porcelain work receives much attention and a number of porcelain furnaces of the latest pattern have been installed. Porcelain baking can be carried on at any time without inconvenience or delay. Such apparatus as

electric cautery, root-driers, mouth lamps and gold annealers are also provided.

The hall of anatomy is a hexagonal, fireproof building of Bedford stone with granite foundations. The interior finish is designed to be aseptic. The building contains dissecting rooms with accommodations for twenty tables,



an amphitheatre with seating capacity of 225 persons, offices, reading rooms, anatomical museum and preserving room.

The general medical buildings are in the second building of the quadrangle. The first floor is occupied by the department of physiology; the second by the department of histology and embryology; the third by the laboratories of pathology and bacteriology, the pathological museum and the clinical laboratory. This building also contains two large amphitheatres, laboratories for special research, recitation rooms, faculty room, library and waiting rooms. Both of these buildings are new and equipped with modern appliances for both elementary and advanced work.

The college museum comprises the celebrated Patrick collection, illustrating comparative dental anatomy, together with many other rare and valuable specimens. A special library of dental and surgical works is maintained and dental students have also the privileges of the general library of the University.

The faculty at present (1908) consists as follows:

GEORGE EDWIN MACLEAN, PH. D., LL. D., President.

WILLIAM SUITS HOSFORD, B. A., D. D. S., Dean; Professor of Dental Prosthesis.

CHARLES CLEVELAND NUTTING, M. A., Professor and Head of the Department of Zoology, and Curator of the Museum of Natural History.

ELBERT WILLIAM ROCKWOOD, PH. D., M. D., Professor and Head of the Department of Chemistry and Toxicology.

CHARLES SUMNER CHASE, B. S., M. A., M. D., Professor of Materia Medica and Therapeutics.

FRANK THOMAS BREENE, D. D. S., M. D., Professor of Operative Dentistry and Therapeutics.

ERNEST ALBERT ROGERS, D. D. S., M. D., Professor of Regional Anatomy and Clinical Dentistry, and Superintendent of Clinics.

GEORGE VAN INGEN BROWN, D. D. S., M. D., C. M., Professor of Dental Pathology and Oral Surgery.

JOHN THOMAS MCCLINTOCK, B. A., M. D., Professor of Physiology.

HENRY ALBERT, M. S., M. D., Professor of Pathology and Bacteriology.

HENRY JAMES PRENTISS, M. E., M. D., Professor of Anatomy, and Director of the Histological Laboratory.

RICHARD SUMMA, D. D. S., Professor of Orthodontia.

ROSCOE HENRY VOLLAND, D. D. S., M. D., Professor of Operative Dentistry.

HENRY MORROW, D. D. S., Assistant Professor of Prosthetic Dentistry.

ANFIN EGDAHL, B. S., M. D., Assistant Professor of Pathology and Bacteriology.

WALTER HENRY FOX, M. D., Assistant Professor of Anatomy.

CHARLES DELOS POORE, A. C., Acting Assistant Professor of Chemistry.

FREDERICK POMEROY LORD, A. B., M. D., Demonstrator of Anatomy, and Assistant in Surgery.

CALVIN WALDO HARNED, D. D. S., M. D., Demonstrator of Prosthetic Dentistry.

JOHN JOSEPH LAMBERT, M. S., Instructor in Histology and Embryology.

JAMES CHARLES MCGREGOR, M. D., Demonstrator in Materia Medica.

FRED JAMES LONGWORTH, A. C., Instructor in Chemistry.

ARNOLD VICTOR DAHLBERG, A. C., Instructor in Chemistry.

AUGUSTE LAWRENCE POULEUR, Instructor in Chemistry.

OSWALD CHARLES FLUEMER, M. D., Demonstrator in Anatomy.

RUDOLPH ERNST KLEINSORGE, B. S., Assistant Instructor in Physiology.

ARTHUR DANIEL WOODS, M. D., Assistant Demonstrator of Anatomy, Histology, and Embryology.

HENRY CLARK PELTON, D. D. S., Assistant Demonstrator of Clinical Dentistry, and Assistant in Orthodontia.

CHARLES WILLIAM WILKINSON, D. D. S., Assistant Demonstrator of Prosthetic Dentistry.

SELSKAR MICHAEL GUNN, B. S., Lecturer on Hygiene.

CHICAGO COLLEGE OF DENTAL SURGERY.

CHICAGO, ILL.

BY TRUMAN W. BROPHY, M. D., D. D. S., LL. D.

The first organization of dentists in Illinois, the Chicago Dental Society, came into existence on the twenty-sixth of January, 1864, and from that date was occasionally discussed the feasibility of establishing a dental college in Chicago.

During the succeeding five years the movement took such form that the Rush Medical College decided to found a department of dentistry. Application to the Illinois state legislature was therefore made for a charter, which was granted on March 12, 1869, to Horace White, Allan N. Towne, Thomas Drummond, Francis Munson, Robert Collyer, George S. Bowen, George Hibben, Robert L. Rea, Samuel B. Noble, John B. Rice, George H. Cushing, Robert C. Hammill and their associates. The corporation thus created was known as the Chicago Dental College, and its object was to establish and maintain a dental college and dispensary in Cook county.

Various unsuccessful attempts were made to put in operation the charter of 1869, and during the succeeding year the faculty of the Rush Medical College proposed the following arrangement to the trustees of the Chicago Dental College:

The faculty of the dental college shall consist of not less than seven members; of these, three, viz., chemistry, anatomy and physiology, shall be filled by appointing those holding the like chairs in the Rush Medical College. The dental students shall have admission to all regular lectures of the Rush Medical College, and the lectures of those professors holding professorships in both schools shall be only those of their regular course of lectures in the Rush Medical College. The special dental lectures shall be given in such a way as not to encroach on the course of medical instruction in the Rush Medical College. The fees at the dental college shall be the same as those of the



GEORGE H. CUSHING M.D., D.D.S.
ONE OF THE FOUNDERS

A CORNER OF
THE MUSEUM

W.W. ALLPORT, M.D., D.D.S.
ONE OF THE FOUNDERS



CHICAGO COLLEGE OF DENTAL SURGERY



OFFICE OF
THE INFIRMARY

TRUMAN W. OSOPHY M.D., D.D.S., D.D.
DEAN

A CORNER OF
THE LIBRARY

Rush Medical College, and one-half of the professors' tickets shall go to the Rush Medical College, and any incidental expenses above the ordinary expenses of the Rush Medical College incurred by the dental college shall be paid by the said dental college, but in no case will any rent be charged for the use of the college building.

Inasmuch as the dental department was not organized, the proposed arrangement was, of course, never consummated. Not discouraged in its long-continued efforts to place a dental department or college on a sound footing, the Rush Medical College made various overtures to the Chicago Dental Society looking to that end. At length, in September, 1876, the society appointed a committee, consisting of M. S. Dean, George H. Cushing, Gorton W. Nichols, Edgar D. Swain and Truman W. Brophy, to confer with the committee from the Rush Medical College, composed of Joseph P. Ross, E. L. Holmes, J. F. Freer, W. S. Haines, Charles T. Parkes and Norman Bridge. While the faculty of the college desired to organize, it was finally decided that, for a time at least, it was best to abandon the attempt. The views presented by the committee of the Chicago Dental Society were to the effect that the dental colleges now in operation in the United States were sufficiently numerous to meet the demands then existing for educational work in this special line; that those in operation were not so supported as to *enable them* satisfactorily to carry on this educational work, and for these reasons the committee was not in favor of organizing another school.

In 1880 another effort was made to organize a dental department of Rush Medical College. A meeting was held at the office of Dr. Charles T. Parkes, No. 125 State street, at which were present Drs. W. W. Allport, E. S. Talbot, Truman W. Brophy, Walter S. Haines and James H. Etheridge, to discuss the matter and come, if possible, to some definite conclusion. Those in attendance were divided in their opinions as to the educational scope and plan of the proposed institution.

Dr. Allport contended that the students should be graduates in medicine before taking the course in dentistry and receiving the dental degree. Students in medical colleges might enter the dental course of instruction, but prior to graduating in dentistry must obtain the degree of M. D., thus placing them in the position of specialists in the practice of medicine. Dr. Parkes opposed this plan on the ground that the courses outlined required an attendance of five years and that few men would care to devote so much time to college work; besides, those who thus took up the study and practice of dentistry (while there might be distinguished exceptions) would, as a rule, have been failures in medicine and would not be desirable additions to the province of dentistry, whether as students or practitioners. As stated, Dr. Parkes op-

posed the plan, at the same time agreeing not to antagonize any effort which might be made to organize a dental infirmary or college. The outcome of the conference was that Rush Medical College dropped the matter entirely, so far as organizing a dental department was concerned; but, fortunately, a sufficiently strong sentiment existed to prevent the matter from being dropped completely by those who were most vitally interested.

The point has now been reached where commences the history proper of the Chicago College of Dental Surgery. During the summer of 1882, the movement to organize an independent dental college took such definite and encouraging form that in October of that year application was made to the secretary of the state of Illinois for a license to open books for subscription to the capital stock of the institution. Such license was issued to Gorton W. Nichols, Truman W. Brophy, Frank H. Gardiner, A. W. Harlan and Eugene S. Talbot, as commissioners to open books and transact the business of the corporation. On February 20, 1883, in the office of the secretary of state, the commissioners filed a report of their proceedings under the license, upon which date a charter was granted legalizing the corporation under the name of "The Chicago Dental Infirmary." On June 30, 1884, the name of the institution was changed to that by which it is now known, the Chicago College of Dental Surgery.

The first regular session of the infirmary opened March 12, 1883, continuing twenty weeks, or until July 31. As this was the father of the college, which has since developed into one of the largest institutions of the kind in the world, it is of interest to know who were the members of its chief boards of management and education. They were as follows:

BOARD OF COUNSELORS.

Hons. Lyman Trumbull, John Wentworth, Carlile Mason and B. C. Cook; Rev. Robert D. Shepard and Dr. George F. Root, and Messrs. William K. Ackerman, E. H. Sargent, Murry Nelson, Wirt Dexter, William Penn Nixon, George W. Lyon, John V. Farwell, William M. Hoyt and George M. Pullman.

BOARD OF DIRECTORS.

N. S. Davis, M. D., LL. D., Chicago Medical College; William H. Byford, A. M., M.D., Woman's Medical College; N. B. Delamater, A. M., M. D., Chicago Homeopathic Medical College; Norman Bridge, M. D., Rush Medical College; A. Reeves Jackson, A. M., M. D., College of Physicians and Surgeons; Milton Jay, M. D., Eclectic Medical College; James A. Swasey, Eugene S. Talbot, M. D., D. D. S.; Frank H. Gardiner, M. D., D. D. S.; Truman W. Brophy, M. D., D. D. S.; A. W. Harlan, M. D., D. D. S.; and Gorton W. Nichols, M. D.

HISTORY OF DENTAL SURGERY

EXECUTIVE COMMITTEE.

Frank H. Gardiner, Truman W. Brophy, Eugene S. Talbot, A. W. Harlan and Gorton W. Nichols.

OFFICERS OF THE INFIRMARY.

James A. Swasey, President; A. W. Harlan, D. D. S., Vice President; Eugene S. Talbot, M. D., D. D. S., Recording Secretary; Truman W. Brophy, M. D., D. D. S., Corresponding Secretary; Edgar D. Swain, D. D. S., Treasurer.

FACULTY.

W. W. ALLPORT, M. D., D. D. S., Professor of Dental Pathology and Therapeutics.

GEORGE H. CUSHING, D. D. S., Professor of Principles and Practice of Dental Surgery.

L. P. HASKELL, Professor of Prosthetic Dentistry and Oral Deformities.

At its origin the college was a post-graduate school, known as the Collegiate Department of the Chicago Dental Infirmary. Its students were first required to obtain the degree of Doctor of Medicine, or its equivalent, from some college recognized by the Illinois State Board of Health, and to take two courses of lectures with the infirmary before receiving the degree of Doctor of Dental Surgery. Such a system of education for dentists was urged because, as has already been stated, the prime movers in the establishment of the institution, holding that dentistry was but a department of medicine, believed that dentists should be educated in medicine before beginning the study of this specialty. The organization was effected under the most favorable auspices. There were at that time seven medical colleges in Chicago, six of which were represented on the board of directors, and the opening lecture was delivered by that scholar, celebrated speaker and distinguished physician, Dr. N. S. Davis.

During the first session there were three professors and eight lecturers in the institution. The professors taught the principles and practice of Dental surgery, operative dentistry and prosthetic dentistry, and the lecturers devoted themselves to dental anatomy, dental pathology and other special branches not followed minutely in medical colleges. Eighteen students were enrolled for the first course, and at its close there were no candidates for the degree. Two, however, entered the examinations for a special certificate, both of whom failed. During the following course eleven names were entered in the matriculation book, two candidates entered the final examinations, and, after successfully passing them, received the degree of Doctor of Dental Surgery. The first graduates of the college, were C. W. Carson and A. E. Baldwin, both of whom are now engaged in practice in the city of Chicago. The honorary degree of D. D. S. was conferred upon Edmund Noyes.

It was in the middle of the second course that a new charter was obtained for the organization of the Chicago College of Dental Surgery, which

from that time (June 30, 1884, as stated) supplanted the Collegiate Department of the Chicago Dental Infirmary. In explanation of the change, I will quote a portion of my address delivered at the sixth annual commencement exercises of the college, in March, 1888:

The institution, as organized, did not receive the large support which was expected from the medical profession; second, the dentists of Chicago and the northwest could not, or would not, encourage and support a college which required a course of study twice as long as did the older and honored dental colleges of the east. Their students, therefore, came to us, investigated, said they wished to become dentists, not physicians, and moved on to some regular dental college. The medical graduates who came were in many instances, imbued with the opinion that the knowledge to be acquired, in addition to what they already possessed, was purely mechanical and exceedingly simple. Moreover, we discovered that those who had not engaged in dental study prior to, or along with, their medical training attached too little importance to dental science and art. Thus vanished our fondly cherished hopes of practically teaching dental and oral surgery, and making it a specialty in medicine by conferring the dental degree only upon those who had first received the degree in medicine. Attractive though the theory was, it was found impracticable, and the educating of physicians to become dentists proved in this instance, at least, far short of a success.

To say that it is not possible by careful training in a dental college to make a skillful, accomplished dentist of a gentleman who has been previously educated in medicine and practiced that profession would be preposterous. Still, one thus educated would be the better dentist had he begun the study of dentistry first, and had dentistry, his life work, constantly before him, instead of carrying in his mind the expectation of engaging in general medical practice. While a knowledge of the underlying principles of medicine is indispensable to the dentist, he must always study to appropriate these principles to his use as a dentist. A change came. The board of directors experienced what might be termed a "remoleculization" of ideas. In its beginning it was medicine first and practical dentistry afterward. Now, as the politicians would say, it is practical dentistry, "first, last and all the time," accompanied by the teaching of anatomy, chemistry and physiology and the principles of medicine and surgery, thereby presenting to the student's mind those branches of knowledge which we regard essential to a well-informed practitioner of dental and oral surgery.

In addition to this radical change in the plan of instruction, the curriculum was extended so as to include, besides the departments named, general pathology, materia medica and therapeutics. Practical anatomy received the same attention given this subject in the best regulated medical colleges, and a complete course in the chemical laboratory was a requirement for admission to the examinations for the dental degree. Physiology and histology were brought to a high grade of practical value in the histological laboratory, and microscopical work was made obligatory.

The Chicago College of Dental Surgery was the first institution of its

kind in this country to introduce and use for the benefit of its students a complete apparatus for the cultivation of microbes, thus demonstrating the agents active in establishing caries of the teeth and effecting their destruction. This institution was also the first to organize its junior students in the prosthetic department into classes for practical work in dental technics, both operative and prosthetic. In addition to these innovations in teaching, semi-daily clinics were organized in the college infirmary, being conducted for the benefit of the senior students by most skillful and successful practitioners. This clinical instruction is still carried on systematically and to an extent unequalled in former years.

While upon the subject of innovations in dental education which have originated with the Chicago College of Dental Surgery, mention must be made of the pioneer class of dental practitioners, which, in April, 1889, assembled for a special course of instruction to be given by the faculty of that institution. This so called "practitioners' course" was decided upon at a meeting called by Dr. Brophy, president and dean of the faculty, during the preceding January. The course extended over a period of four weeks, and at its conclusion those who had taken it, thirty-two practitioners from Illinois, Ohio, Missouri, Mississippi, Georgia, Wisconsin, Indiana, Iowa, Nebraska, Oregon and Germany, passed most enthusiastic resolutions commending the action of the college in providing such a course and the able manner in which it had been conducted.

With the reorganization of the institution as the Chicago College of Dental Surgery, the faculty was increased from nine to seventeen members, and the college, during the session of 1884-85, showed in its attendance a gratifying effect of this expansion of plan and machinery. As against twenty-five matriculates and two graduates for the session of 1883-84, the succeeding collegiate year—that of 1884-85—graduated twenty-two out of fifty matriculates.

Thus, at the present time, the Chicago College of Dental Surgery, which since 1889 has been a department of the Lake Forest University, is one of the largest institutions of its kind in the world. During 1893 it erected and now occupies a magnificent building on the corner of Wood and Harrison streets, which is prominent even among a group of the fourteen other fine structures, comprising medical colleges, hospitals and schools. It is a five story and basement building, the basement and first story being of rock-faced Bedford stone and the superstructure of pressed brick and terra-cotta, the entire edifice having an imposing frontage of eighty-five feet and a depth of one hundred and twenty feet.

The building has two entrances, the main one through a large cut stone doorway surrounded by a stone arch beautifully ornamented with carved work. The interior is furnished in hard wood, according to the latest idea of elegance, convenience and comfort. The entire six floors of the building are divided into lecture rooms, class rooms, clinic rooms, etc., with the exception of the second floor, which is devoted to the dental infirmary. The chief lecture room has a seating capacity for four hundred and fifty students. There is also a dissecting room thoroughly equipped with all the requisites for the study of human anatomy. There are histological, chemical and bacteriological laboratories, also laboratories for the study of operative and prosthetic techniques, and for the construction of artificial dentures. Reading rooms, a library and museum for the students and waiting rooms for the patients are provided.

The original building was erected at a cost of \$75,000 and was one of the most complete structures of the kind in existence, but the remarkable growth of the institution made such an extension necessary as would nearly double its capacity and accommodations. The addition, which was completed in the fall of 1896, especially provided for an extension of laboratory and infirmary work, and better lecture, reading and library rooms, and furnished the students with a complete gymnasium.

Naturally, however, before attaining its present standing the Chicago College of Dental Surgery has had its home in various localities and in a variety of structures. During the first three years of its existence as infirmary and college, its headquarters were at 22-26 Adams street and 5-6 Washington street. The rooms in which the lectures and clinics were held were well lighted, fitted with chairs, engines, brackets, etc., both in the operating room and laboratory. The appliances also included a continuous gum furnace, nitrous oxide apparatus, drawers for the safe-keeping of the students' instruments, forceps and medicine cases and microscopes.

In 1886, owing to the rapid growth of the college, a lease was secured of the building at the northeast corner of Madison street and Wabash avenue, having a frontage of sixty feet on the latter thoroughfare and one hundred and sixty-five feet on the former. As the rear of the structure rested in Dearborn place excellent light was obtained from three directions. The college rooms consisted of lecture and faculty rooms, museum, convenient quarters for the infirmary, with a capacity for sixty chairs, chemical, mechanical and physiological laboratories, dissecting room, administration office and conveniences for patients, students and visitors.

After remaining at this location for five years, a removal to more commodious quarters became necessary, the management securing the three upper floors of the building situated at the northeast corner of Michigan avenue and Randolph street. The frontage was fifty feet on Michigan avenue and one hundred and fifty feet on Randolph street, with the rear resting on Central avenue.

The next change made by the college was to its present location, in 1893, where it is appropriately established in the midst of the great medical district of Chicago—housed in a structure which is both massive and ornamental, as befits one of the most important institutions of Chicago, the west and the United States.

The founders of the Chicago College of Dental Surgery being desirous of making a university affiliation, which would insure its permanence for the future, in July, 1906, entered into an affiliation with the Valparaiso University of which it is now the dental department.

The faculty at present, 1908, is as follows:

HENRY B. BROWN, A. M., President of Valparaiso University.

TRUMAN W. BROPHY, M. D., D. D. S., LL. D., Dean of Faculty, Professor of Oral Surgery.

C. N. JOHNSON, M. A., L. D. S., D. D. S., Dean of Students, Professor of Operative Dentistry.

W. L. COPELAND, M. D., C. M., M. R. C. S., Secretary, Professor of Anatomy.

CALVIN S. CASE, M. D., D. D. S., Professor of Orthodontia.

J. NEWTON ROE, A. M., Sc. D., Professor of Chemistry and Metallurgy.

HART J. GOSLEE, D. D. S., Professor of Prosthetic Dentistry and Crown and Bridge Work.

CASSIUS C. ROGERS, A. B., M. D., Professor of Physical Diagnosis.

W. H. G. LOGAN, M. D., D. D. S., Professor of Oral Pathology, Associate Professor of Oral Surgery.

J. P. BUCKLEY, PH. G., D. D. S., Professor of Materia Medica and Therapeutics.

PATRICK H. O'DONNELL, A. M., LL. D., Professor of Dental Jurisprudence.

W. H. HERSH, M. D., D. D. S., Professor of Physiology.

CHARLES H. DEWITT, A. B., M. S., Professor of Bacteriology and Histology.

RUDOLPH BECK, D. D. S., Professor of Dental Anatomy.

LEONARD C. BORLAND, M. D., L. P., Adjunct Professor of Anatomy.

ROLLIN B. TULLER, D. D. S., Clinical Professor of Operative Dentistry.

L. S. TENNEY, D. D. S., Associate Professor of Operative Dentistry.

W. L. CALLOWAY, Associate Professor of Anatomy.

J. A. BULLARD, D. D. S., Clinic Professor of Prosthetic Dentistry, Associate Instructor in Dental Orthopedia.

ELMORE W. ELLIOT, Associate Professor of Materia Medica and Therapeutics.

W. L. SECOR, A. M., Lecturer on Neurology.

INSTRUCTORS AND DEMONSTRATORS.

- LEONARD C. BORLAND, M. D., L. P., Instructor in Anatomy.
 G. W. JOHNSON, D. D. S., Instructor in Prosthetic Technics.
 J. R. WATT, D. D. S., Instructor in Prosthetic Technics.
 W. H. HERSH, D. D. S., M. D., Instructor in Operative Dentistry.
 R. E. MACBOYLE, D. D. S., Instructor in Operative and Prosthetic Dentistry.
 W. D. N. MOORE, L. D. S., D. D. S., Instructor in Inlay Work
 F. F. MOLT, D. D. S., Assistant in Clinical Surgery.
 M. G. FOX, D. D. S., Assistant in Clinical Surgery.
 F. M. RICHARDSON, D. D. S., M. D., Demonstrator in Extracting.
 T. L. GRISAMORE, D. D. S., Demonstrator in Orthodontia and Instructor in Orthodontia Technic.
 VICTOR HITZ, D. D. S., Instructor in Operative Dentistry.
 A. BROM ALLEN, D. D. S., Demonstrator of Extracting.
 R. H. GOOD, M. D., Instructor in Physical Diagnosis.
 CHAS. H. DEWITT, B. S., A. B., Instructor in Histology and Bacteriology.
 JOHN H. CLOUD, B. S., A. M., Lecturer on Metallurgical Physics.
 W. A. BUSCHO, PH. G., D. D. S., Demonstrator in Chemistry.
 C. M. CAHILL, D. D. S., Instructor in Operative Dentistry.
 J. E. SCHAEFER, D. D. S., Instructor in Prosthetic Dentistry.
 R. R. HARTLEY, D. D. S., Instructor in Operative Dentistry.
 J. C. Y. MOORE, D. D. S., Registrar.

UNIVERSITY OF MINNESOTA COLLEGE OF DENTISTRY.

MINNEAPOLIS, MINN.

BY ALFRED OWRE, M. D., C. M., D. M. D.

The first organized movement directed toward the teaching of dentistry at the University of Minnesota was made in the year 1883. This was accomplished by the directors of the Minnesota College Hospital, this school then becoming known as the dental department of the university. The first faculty was:

- F. A. DUNSMOOR, M. D., Dean and Professor of Surgery.
 M. M. FRISSELLE, M. D., D. D. S., Professor of Medical and Surgical Dentistry.
 W. T. GIDDINGS, D. D. S., Professor of Operative Dentistry.
 T. H. BUNIMER, D. D. S., Professor of Prosthetic Dentistry and Metallurgy.
 A. W. ABBOTT, M. D., Professor of Anatomy.
 CHARLES W. DREW, PH. B., M. D., Professor of Chemistry.
 T. JONES, M. D., Professor of Physiology.
 C. H. HUNTER, M. D., Professor of Pathology and Microscopy.
 T. F. QUINBY, M. D., Professor of Materia Medica.

J. A. PARKER, Demonstrator of Operative Dentistry.
 T. E. WEEKS, Demonstrator of Operative Dentistry.
 W. N. MURRAY, Demonstrator of Mechanical Dentistry.
 E. F. CLARK, Demonstrator of Mechanical Dentistry.

The session began in October and lasted for four months. Two courses were required for graduation with a term of three years under a preceptor. Five years of actual practice were accepted in lieu of the first course of lectures.



The building used was the hospital located at the corner of Second and Banks streets, East.

At the beginning of the session of 1884-85, R. O. Beard, M. D., was made professor of physiology. W. A. Spaulding, D. D. S., was made professor of mechanical dentistry; L. D. Leonard and C. E. Cleveland demonstrators of Operative Dentistry, and J. H. Spaulding, C. H. Goodrich, D. D. S., and A. L. Lyon, D. D. S., clinical demonstrators.

It was found expedient to continue the medical college with its dental department under separate management from that of the hospital, hence a re-

organization was effected in 1885. The name was changed to the Minnesota Hospital College.

A new and commodious building was erected and well equipped, partly through donations. Professional and public cooperation was now assured and became an important factor in the growth of the dental school.

W. T. Giddings was made dean of the faculty, but did not serve long in that capacity owing to his removal from the city. W. A. Spaulding, D. D. S., was chosen to succeed Dr. Giddings as dean. Other changes in the faculty that took place that year were the following:

M. G. JENISON, M. D., D. D. S., Professor of Dental Pathology, *Materia Medica* and Therapeutics.

J. H. MARTINDALE, M. D., D. D. S., Lecturer on Oral Diseases and Deformities.

E. S. TALBOT, D. D. S., Clinical Instructor.

H. A. KNIGHT, D. D. S., Clinical Instructor.

In 1886 the course was lengthened to six months and the following changes in the faculty effected:

T. E. WEEKS, D. D. S., Professor of Operative Dentistry.

C. M. BAILEY, D. M. D., Professor of Dental *Materia Medica*.

E. H. ANGLE, D. D. S., Professor of Histology.

J. W. PENBERTHY, D. D. S., Lecturer on Practical Dentistry.

L. P. HASKELL, Special Instructor in Prosthetic Dentistry.

JOHN MARSHALL, J. A. BOWMAN, E. B. DILLINGHAM, D. D. S., EDGAR PALMER, S. T. CLEMANT, D. D. S., H. M. LONGBRIDGE, A. W. FRENCH, L. GOULD, F. A. WILLIAMSON, Clinical Instructors.

In 1887-88, D. Day, D. D. S., was given charge of the infirmary and A. T. Smith was made clinical instructor. Up to this time only sixteen students had graduated, although many others had attended lectures and received clinical instruction, some of them graduating from other institutions.

Since 1882 the University of Minnesota had conducted medical examinations and conferred the degrees of M. B. or M. D., but no regular course of instruction had been offered. It was apparent at that time that the consensus of opinion favored university control of technical schools, and accordingly an effort was made to absorb practically all teaching institutions of that character. As a result of that movement the university, in 1888, was able to offer its first actual course in dentistry, having combined under university management several such schools.

The board of trustees of the Minnesota Hospital College and the St. Paul Medical College, which maintained a dental department, appeared at a meeting of the board of regents of the university, held February 28, 1887, and

tendered the use of the properties of these schools to the state for medical college purposes. Leases were offered the state for a period of five years and this offer was accepted by the regents.

In March the board of trustees of the Minnesota Homeopathic Medical College made the state a practically similar offer, which was also accepted. A committee was appointed to nominate a faculty, with the following result, for the college of dentistry:

CYRUS NORTHRUP, L. L. D., President.

CHARLES M. BAILEY, D. M. D., Secretary and Professor of Prosthetic Dentistry and Materia Medica.

THOMAS E. WEEKS, D. D. S., Professor of Operative Dentistry.

EDWARD H. ANGLE, D. D. S., Professor of Histology and Orthodontia.

L. D. LEONARD, Professor of Pathology and Therapeutics.

A. F. RITCHIE, M. D., Professor of Anatomy.

R. O. BEARD, M. D., Professor of Physiology.

C. J. BELL, A. B., Professor of Chemistry.

The course of instruction was graded and extended to three years of six months each. Solidity and real progress in all respects were now practically assured and furthermore a general satisfaction with university control seemed to prevail throughout the state.

In 1890, W. X. Sudduth, M. D., D. D. S., of Philadelphia, was called to succeed Dr. Bailey as secretary—the latter remaining in the faculty—and Dr. Leonard as professor of pathology and oral surgery. The school term was lengthened to eight months. The following year Dr. Sudduth was made dean of the faculty.

In 1892 the first of a series of new buildings for the medical department was completed. This structure was located on the university campus and the beginning of the session of 1892-93 made university association felt in many ways.

In 1895, T. E. Weeks, D. D. S., was made dean, Dr. Sudduth resigning, and F. B. Kremer, D. D. S., professor of prosthetic dentistry and crown and bridge work. In 1897, Dr. Weeks resigned as dean, but remained as professor of operative dentistry until 1901.

The course was lengthened to eight and one-half months in 1897-98, and again to nine months in 1898-99, thus conforming to the course of the college of science, literature and arts.

W. P. Dickinson, D. D. S., was made secretary of the college, beginning with the session of 1897-98, and dean at the beginning of the session of 1901-

02. He resigned in 1905 and was succeeded by Alfred Owre, M. D., C. M., D. M. D., the present incumbent.

The present faculty of the college consists of thirteen professors and thirty instructors. Five modern and well equipped buildings are devoted to the medical and dental colleges. The college of science, literature and arts accepts the first year in dentistry as an elective fourth year, thus making it possible to obtain the two degrees in six years.

The growth of the college of dentistry since its affiliation with the university has been remarkable. It has made rapid advances and kept well to the front in dental teaching, and enjoys the respect and confidence of the profession and the community. The graduates from the college number 410, the majority of whom are practicing in Minnesota. The college is not able to admit all applicants who wish to study dentistry, owing to the lack of accommodations and the university policy of limiting classes in order to insure better results.

The college of dentistry is a harmonious factor in the progress and development of dentistry in the state of Minnesota. There is peaceful co-operation with other bodies working toward the same end which is conservative advancement with mutual protection for the public and profession. The college has fulfilled its mission so far as circumstances have permitted and it is the sincere hope of those interested that the state will continue to stimulate progress by providing buildings and other equipment whenever needed.

The faculty at present, 1908, consists of:

CYRUS NORTHROP, LL. D., President.

ALFRED OWRE, D. M. D., M. D., C. M., Dean, Professor of Operative Dentistry and Dental Metallurgy.

RICHARD O. BEARD, M. D., Professor of Physiology.

CHARLES A. ERDMANN, M. D., Professor of Anatomy.

GEORGE B. FRANKFOTER, M. A., Ph. D., Professor of Chemistry.

THOMAS B. HARTZELL, M. D., D. M. D., Professor of Clinical Pathology, Therapeutics and Oral Surgery.

THOMAS G. LEE, B. S., M. D., Professor of Histology and Embryology.

F. W. SPRINGER, E. E., Professor of Electrical Engineering.

JAMES M. WALLS, D. M. D., Professor of Clinical Operative Dentistry.

OSCAR A. WEISS, D. M. D., Professor of Prosthetic Dentistry and Orthodontia.

JAMES O. WELLS, A. M., D. M. D., Professor of Crown and Bridge-Work.

FRANK F. WESBROOK, M. A., M. D., Professor of Pathology and Bacteriology.

IRA HARRIS DERBY, B. S., Assistant Professor of Chemistry.

ARTHUR W. MEYER, A. B., M. D., Assistant Professor of Anatomy.

WINFIELD S. NICKERSON, Sc. D., M. D., Assistant Professor of Histology and Embryology.

- M. R. WILCOX, M. D., Assistant Professor of Physiology.
 NORMAN J. COX, B. S., D. M. D., Instructor in Operative Dentistry.
 G. M. DAMON, D. D. S., Instructor in Prosthetic Dentistry and Dental Anatomy.
 H. S. GODFREY, D. M. D., Instructor in Operative Dentistry.
 R. L. GREEN, D. D. S., Instructor in Operative Dentistry.
 J. A. HANDY, Ph. C., Instructor in Chemistry.
 EARLE R. HARE, B. S., M. D., Instructor in Anatomy.
 MARY V. HARTZELL, D. M. D., Instructor in Comparative Dental Anatomy.
 U. E. HEDDY, D. D. S., Instructor in Operative Technics.
 E. E. HEMINGWAY, Ph. D., Assistant in Anatomy.
 W. F. LASBY, B. S., D. D. S., Instructor in Technics.
 J. F. LEMSTROM, M. D., Instructor in Histology and Embryology.
 HERMAN A. MAVES, D. D. S., Instructor in Operative Dentistry.
 R. H. MULLIN, B. A., M. B., Senior Demonstrator in Pathology and Bacteriology.
 OSCAR OWRE, M. D., Instructor in Oral Surgery.
 JAY N. PIKE, D. D. S., Instructor in Prosthetic Dentistry, Orthodontia and Dental Anatomy.
 C. C. PRATT, M. D., Demonstrator in Pathology and Bacteriology.
 H. M. REID, D. D. S., Instructor in Prosthetic Dentistry.
 H. E. ROBERTSON, A. B., M. D., Demonstrator in Pathology.
 J. F. SCHEFCIK, B. S., Ph. G., M. D., C. M., Instructor in Materia Medica.
 J. P. SEDGWICK, B. S., M. D., Instructor in Physiological Chemistry.
 C. C. TYRELL, B. A., M. D., Prosector of Anatomy.
 ANDREW J. WEISS, Instructor in Technics.
 AMOS S. WELLS, B. A., D. D. S., Instructor in Crown and Bridge-Work.
 FRANK R. WRIGHT, D. D. S., M. D., Instructor in Anæsthesia and Oral Surgery.
 FRED S. YAEGER, D. D. S., Instructor in Crown and Bridge-Work.
 MRS. M. C. CLYDE, Professional Nurse.
 MISS H. E. COOKE, Professional Nurse.
 A. L. MOORE, Infirmary Clerk.

MEHARRY DENTAL COLLEGE.

NASHVILLE, TENN.

By G. W. HUBBARD, M. D.

Meharry Dental College of Walden University, Nashville, Tenn., was organized in 1886 for the purpose of providing dental education for colored students. It was the first school opened in the south for the education of colored dentists, and nine students were enrolled during the first session. The number has increased gradually until now the number of students has reached 116.

During the twenty-one years of the school's existence 123 students have completed the course in dentistry and received the degree of D. D. S. The greater part of this number are practicing their profession successfully in the southern and southwestern states. They have been well received and kindly



treated by the dental profession of the south and have been well patronized by the people of their own race.

Meharry college is a member of the National Association of Dental Faculties. There are seventeen members in its faculty. The course of study consists of four sessions of twenty-six weeks each.

HOWARD UNIVERSITY DENTAL DEPARTMENT.

WASHINGTON, D. C.

BY A. J. BROWN, D. D. S.

Howard University was chartered by act of Congress March 2, 1867. In conformity with the spirit of the organic law of the university, the Medical department, including the medical, dental and pharmaceutic colleges, is open to all persons, without regard to sex or race, who are qualified by good moral character, proper age and suitable preliminary education.

The beginning of the dental college may be put down as October 11, 1881, with the appointment of a lecturer on practical dentistry to the medical class.

Eight months afterward, June 5, 1882, the executive committee appointed Dr. N. W. Whitcomb, of Buffalo, N. Y., as the first professor of operative dentistry and the following mention was made in the announcement for the next session: "Instruction in operative dentistry will be given to those desiring it under the supervision of N. W. Whitcomb, D. D. S., and others, for which a small fee will be charged."

It was during this session that the nucleus for the dental infirmary was gathered, principally through the generosity of the S. S. White and the Justi companies.

In the following school year of 1883-4, a more systematic course of dentistry was inaugurated by the election of two dental professors and one demonstrator.

In the session of 1884-5 a regular corps of professors and demonstrators was duly appointed and from this year really dates the full college course of the dental department. Courses of lectures were prepared and delivered by the various professors during this term and clinical work was carried on in newly established infirmary at regular intervals, and as a result, one student was graduated. From this time on, though great embarrassment has been felt for proper equipments and want of space, the dental college has grown year by year keeping pace with the advance made by the other departments of the university.

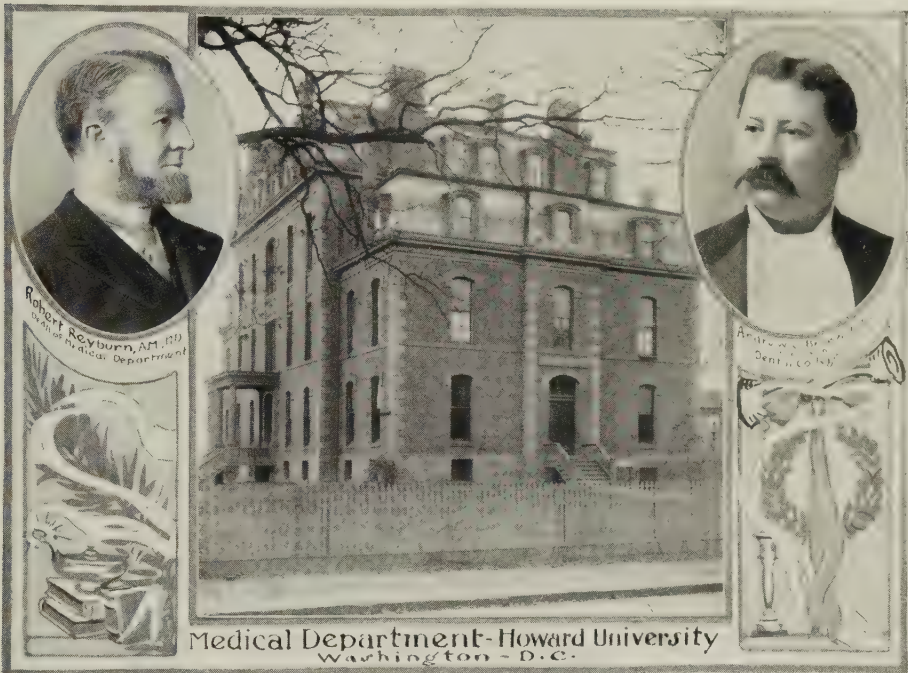
At a faculty meeting held April 23, 1890, Dr. J. F. R. Dufour was elected the first dean of the dental college. This act in a measure separated this department from the medical school under whose supervision and control it had existed heretofore.

In 1893, the first delegate was elected to attend the meeting of the Associa-

tion of Dental Faculties, at which time application for membership to that body was to be acted upon, but this was laid over for further investigation.

The year 1896 saw a reorganization of the faculty. The office of dean of dental department was abolished and a dean and secretary of the medical department, including medical, dental and pharmaceutical colleges, was elected.

Also in 1896 the dental department of Howard University was elected to membership in the National Association of Dental Faculties, and has



been represented in that body, with but two exceptions, from that time until the present.

In the year 1897, a separating of the faculty occurred, dividing it into a senior, or executive, and an associate faculty, the dental department becoming a member of the associate faculty, without representation in the senior body. This was again rearranged in 1904, when Dr. Robert Reyburn was elected dean of the medical school with general supervision over the medical, dental and pharmaceutical departments, and Dr. Andrew J. Brown was elected vice dean of the dental department, with active supervision of the same.

The growth of the dental school has been a steady upward one. From a very small beginning of one instructor in 1881, without any educational qualifications, it has grown to a full dental college with a corps of eleven professors and twelve associate professors and instructors.

Up to date 137 dental students have been given the degree of D. D. S. and the school closed the year of 1907-8 with an enrollment of fifty-eight students, six of whom were members of the graduating class of 1908.

The requirements of the dental department of the Howard University are the same that are demanded of applicants for admission into schools which are members of the National Association of Dental Faculties and the laws of that association are strictly adhered to. Full attendance during the entire term is required and no one is excused until the session is completed.

The present (1908) faculty consists of the following:

REV. WILBUR P. THIRKIELD, LL. D., President of the University.

ROBERT REYBURN, A. M., M. D., Professor of Hygiene.

ANDREW J. BROWN, D. D. S., Vice-Dean; Professor of Operative Dentistry and Operative Technic.

F. J. SHADD, A. M., M. D., Secretary and Treasurer, Professor of Materia Medica, Pharmacology and Therapeutics.

H. PORTER DAVIS, D. D. S., Professor of Prosthetic Dentistry, Dental Metallurgy and Prosthetic Technic.

CLARENCE H. HOWLAND, D. D. S., Professor of Special Dental Anatomy and Pathology, and in charge of Dental Clinics.

C. SUMNER WORMLEY, D. D. S., Lecturer on Crown and Bridge Work, and Superintendent of Dental Infirmary.

AMBROSE E. GASKIN, D. D. S., Demonstrator in Dental Infirmary.

FRED P. BARRIER, Assistant Demonstrator in Dental Infirmary.

DANIEL S. LAMB, A. M., M. D., Professor of Anatomy and Demonstrator of Pathologic Anatomy.

WILLIAM H. SEAMAN, M. D., Professor of Chemistry, Toxicology, Metallurgy, and Director of Chemic Laboratory.

J. MELVIN LAMB, M. D., D. D. S., Professor of Physiology.

EDWARD A. BALLOCH, A. M., M. D., Professor of Oral Surgery.

W. W. ALLEGER, M. D., Professor of Bacteriology and Director of Bacteriologic Laboratory.

PAUL BARTSCH, M. S., PH. D., Professor of Histology, Director of Physiologic and Histologic Laboratories.

WILLIAM C. WOODWARD, M. D., LL. M., Professor of Medical Jurisprudence.

EDWARD D. WILLISTON, A. M., M. D., Associate Professor of Medical Jurisprudence.

JOHN W. MITCHELL, M. D., PHAR. D., Associate Professor of Materia Medica and Therapeutics and Demonstrator of Pharmacology.

CHARLES I. WEST, M. D., Associate Professor of Anatomy.

HERBERT CLAY SPURLOCK, A. B., M. D., Associate Professor of Chemistry.

ALBERT RIDGELEY, M. D., Associate Professor and Demonstrator of Anatomy.

ANNA BARTSCH-DUNNE, M. D., Associate Professor of Histology and Experimental Physiology.

CARROLL A. BROOKS, M. D., Associate Professor of Physiology.

CHARLES W. BOWKER, M. D., Associate Professor of Bacteriology.

JAMES F. JOHNSON, A. M., M. D., Assistant Demonstrator of Anatomy.

LOUISVILLE COLLEGE OF DENTISTRY.

LOUISVILLE, KY.

BY W. E. GRANT, D. D. S.

The Louisville College of Dentistry was founded in the summer and fall of 1886, opening its first term January 1, 1887. Students entering from other dental schools gave the institution a graduating class the first year.

The idea of establishing a dental school was conceived by Dr. A. Wilkes Smith, a graduate of medicine and dentistry, then a teacher of biology in the literary department of Central University, which at that time was located at Richmond, Ky. His ideas on the subject were presented to the university authorities. Through his efforts, and the co-operation of the university authorities, a dental department was established in connection with the Hospital College of Medicine, the medical department of the university, and located at Chestnut and Preston streets in Louisville. Those interested in the original organization and the teachers for the first year were:

A. WILKES SMITH, President and Professor of Operative Dentistry.

CHAS. G. EDWARDS, Vice-President and Professor of Prosthetic Dentistry.

H. B. TILESTON, Demonstrator of Operative Dentistry.

J. H. BALDWIN, Demonstrator of Prosthetic Dentistry.

The medical branches were taught by members of the medical faculty.

After a few years Dr. A. Wilkes Smith retired from the presidency and became emeritus professor of operative dentistry. Dr. Francis Peabody was elected president and professor of operative dentistry. Dr. C. G. Edwards retired and was succeeded by Dr. Charles E. Dunn as professor of prosthetic dentistry, who in turn was succeeded by Dr. H. B. Tileston. In the meantime Dr. Edward M. Kettig was elected to the chair of oral surgery. Upon the death of Dr. Peabody, H. B. Tileston was elected president and professor of operative dentistry and E. M. Kettig vice president and professor of prosthetic dentistry.

Louisville College of Dentistry



H.B. Tileston M.D., D.D.S.
*President and
Prof. of Operative
Dentistry*



W.E. Grant D.D.S.
*Dean and Prof. of
Orthodontia*

Operative Technic Room



College Building



C.G. Edwards D.D.S.



Dr. Francis Peabody

College Infirmary

The first dean was James Lewis Howe, Ph. D., M. D., who was succeeded by Dr. P. Richard Taylor, M. D., W. E. Grant, M. D., D. D. S., was the third, and the present, incumbent of the office of dean.

There was some difficulty experienced in obtaining teachers who had any faith in the establishment and final outcome of the institution, and who were in any manner qualified to take up the instruction. However, the enthusiasts in the movement were much gratified to enroll a student from Maine and one from California, and also to have the central states nearly all represented in the attendance of the first year.

The requirement at this time was five months, in two separate terms, for graduation. During the first session eighteen students were received, eleven of whom were graduated.

At the second term there were in attendance twenty-three students, and the third term forty-five. The attendance increased at about a regular rate until the sixth term, when there were over one hundred students.

The institution experienced a gradual growth from this point on, and its attendance was averaging between 200 and 250 students per session up to and including the year 1904, after which was felt the effect of the increased requirements, both literary and otherwise. Probably the commercial activity of the country and other minor reasons have tended to cut down the attendance, as has been the case in dental, medical, law and other schools, to an average of 160 to 175 matriculates per session. The total number of graduates up to this time (1908) is 848.

The changes in the building and equipment from time to time, as the institution grew and as the facilities for teaching were improved, forms a very important part of this history. Two rooms were sufficient at first, with equipment so small and insignificant that it seems hard to describe.

In a few years the management found it necessary to erect a handsome, four-story structure in front of the old buildings, extending out to the property line. Very shortly they found this not adequate to the needs of the constantly increasing number of dental students, and several thousand dollars were expended in rearranging the interior to give needed expansion on floor space for the dental laboratories.

These changes sufficed for two years, when both departments found themselves uncomfortably crowded, and it was finally decided that the schools must be separated that each department might have its normal growth unhampered by the other. As a consequence the dental department was completely reorganized and a plot of ground was purchased at the corner of Brook street and

Broadway, on which was erected the building now standing there, the beauties and artistic arrangements of which have been commented upon by the profession and by many teachers in other dental institutions.

The members of the present (1908) faculty of the college are:

H. B. TILESTON, President, Professor of Operative Dentistry and Dental Pathology.
 E. M. KETTIG, Vice-President, Professor of Prosthetic Dentistry.
 WILLIAM E. GRANT, Dean, Professor of Orthodontia.
 H. HORACE GRANT, Professor of Oral Surgery and Clinical Surgery.
 NEWTON T. YAGER, Professor of Anesthetics and Oral Diseases.
 W. ED. GRANT, Professor of Anatomy and Osteology.
 PHILLIP F. BARBOUR, Professor of Chemistry and Metallurgy.
 W. M. RANDALL, Professor of Technics, Physics, Dental Anatomy and Porcelain.
 RAYMOND E. GRANT, Professor of Crown and Bridge Work and Clinical Orthodontia.
 MAX M. EBLE, Professor of Practice, Ethics and History.
 H. B. HOLMES, Professor of Materia Medica and Therapeutics.
 ADOLPH O. PFINGST, Professor of Physiology.
 W. CARL GRANT, Associate Professor of Anatomy and Osteology.
 FRED L. KOONTZ, Professor of Histology, Bacteriology and Pathology.
 B. D. RIVERS, Professor of Embryology and Hygiene.
 J. B. JORDON, Instructor in Prosthetic Dentistry.
 E. LEE HEFLIN, Associate Professor of Surgery.
 W. C. GRANT, Instructor in Anatomical Department.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL.

CHICAGO, ILL.

By CHARLES R. E. KOCH, D. D. S.*

The University Dental College which preceded Northwestern University Dental School, was organized under a charter from the State of Illinois in 1887. The first session was held in the winter of 1887-88 with six students, the dental faculty consisting of W. W. Allport (emeritus), L. P. Haskell, R. F. Ludwig, John S. Marshall (dean), A. E. Baldwin, Charles P. Pruyn, C. R. Baker, and Arthur B. Freeman. An agreement was effected between President Cummings of Northwestern University, Nathan S. Davis, dean of the Chicago Medical College (now Northwestern University Medical School), and the faculty of the new dental college, by which its students should take lectures in anatomy, physiology, histology, materia medica, pathology, and surgery

[Most of the early history of the school is taken from the chapter relating to it written by Dr. G. V. Black, in the History of Northwestern University.]



EDGAR D. SWAIN, DDS.
FIRST DEAN



T. L. GILMER, MD, DDS
ONE OF THE FOUNDERS

— CLINIC —



NORTHWESTERN UNIVERSITY DENTAL SCHOOL
CHICAGO



ROTUNDA

G. V. BLACK, MD, DDS, SD, LL.D.
— DEAN —

ORAL
SURGERY

with the medical classes; but this agreement involved no further connection with the medical college. The connection with Northwestern University was also nominal and prospective, the university assuming no responsibility for the dental college.

The new college was located in Chicago on Twenty-sixth street near Calumet avenue, opposite the medical college. The students were required to take a course of three years of seven months each before graduation; at that time other dental schools required two years of six months. This was the first dental college to make this requirement, and this fact operated very much against its success in obtaining students, so that its classes remained very small, there being only eleven students at the end of the second year. With the beginning of the third year the three-year's course was made optional, and the students were allowed to elect to take a two years' course. At the end of the fourth year the class numbered nineteen. The college could not continue to meet its expenses on the income derived from this number of students, and at the end of the year the faculty resigned. This was in the spring of 1891.

In the winter of 1890-91 there were a number of men who had obtained some prominence as teachers in dentistry in Chicago who were not then engaged in teaching. Thomas L. Gilmer gave a dinner at the Leland hotel, to which George H. Cushing, Edgar D. Swain, Edmund Noyes and W. V. B. Ames were invited, and to whom he opened the subject of the formation of a dental school. There were at the time two or three dental schools in the city that were not succeeding well and the question of the reorganization of some of these was discussed, with the result that Dr. Gilmer was authorized to investigate the advisability of the purchase of the American College of Dental Surgery, then under the control of Dr. Clendenin. At a subsequent meeting Dr. Gilmer reported adversely to the purchase of that plant. Chicago University was then in process of organization, and an interview was held with President Harper with reference to the organization of a dental school as a department of that university, but that institution was not ready for such an undertaking. The discussion of various schemes continued from time to time until the resignation of the faculty of the University Dental College seemed to create an opening. Dr. Henry Wade Rogers had recently become president of Northwestern University and was actively engaged in bringing the professional schools, which had previously but a nominal connection with the university at Evanston, into a closer relationship. He was seen with regard to the reorganization of this college, which he actively favored. After a number of conferences between the parties interested, which included the outgoing members of the old faculty

and the officers of Chicago Medical College, an organization was effected under the charter of Northwestern University, and the charter of the University Dental College from the state was allowed to lapse. In making this change the word college was dropped and the word school substituted, in accord with the policy of the university, in which the teaching organizations under its jurisdiction are called schools instead of colleges. The new school took the name Northwestern University Dental School.

The new faculty was composed of Edgar D. Swain (dean), Edmund Noyes (secretary), G. V. Black, George H. Cushing, J. S. Marshall, Charles P. Pruyn, Isaac A. Freeman, Thomas L. Gilmer, Arthur B. Freeman, B. S. Palmer, W. V. B. Ames, Arthur E. Matteson, E. L. Clifford, G. W. Haskins, G. W. Whitefield, D. M. Cattell, and H. P. Smith. Arrangements were made with the medical school by which the dental students took the lectures in anatomy, physiology, histology, chemistry, materia medica and therapeutics, medical jurisprudence and general surgery with the medical classes. The school was removed to more commodious quarters in Twenty-second street, but near enough to be convenient to the medical school, which was also removed to new quarters in Dearborn street near Twenty-fourth. In the summer of 1889 the National Association of Dental Faculties, at the instance of the National Association of Dental Examiners, passed an order which required all schools affiliated with it to extend the course of study to three terms of not less than six months each in separate years before graduation, beginning with the session of 1891-92. The order was complied with at once and the new organization began its first session with a class of fifty-three students, only six of whom came from the old school.

After two years in this location the school was moved into new buildings erected in Dearborn street between Twenty-fourth and Twenty-fifth streets, and was housed with the medical school, each, however, having its own rooms, clinical outfits and laboratories. In this location the school was fairly prosperous and the number of students more than doubled, so that in the fall of 1895 there were one hundred and twenty-eight. With this number in the dental school, and the continued increase in the medical school, the space became overcrowded. It was clear that something else must be done in order to accommodate the increasing demands.

In the meantime the American College of Dental Surgery had been purchased by Theodore Menges and others. Its equipment had been improved, it was being put in a better condition for giving instruction, and its classes were rapidly increasing in numbers. Dr. Menges, who was showing much energy and

tact, especially in gaining students, proposed in the winter of 1895-96 a consolidation of these two schools. This was effected during the following spring on terms which for the time left the principal immediate arrangement of the school in the hands of Dr. Menges, but provided for its ultimate complete ownership by the University.

The American College of Dental Surgery was organized under the control of I. Clendenin, M. D., in 1885 and so continued until 1892. During these years it graduated 116 students. On April 18, 1892, Theodore Menges, Bernard J. Cigrand and George Leininger purchased this school and removed it from 78-82 State street to 479 Wabash avenue, at the corner of Eldridge court. Under the management of its board of directors, consisting of Bernard J. Cigrand, George Leininger, Theodore Menges, Thomas McKay and Ira B. Crissman, the school at once came in harmony with the dental profession and other dental schools and was admitted to the membership of the National Association of Dental Faculties at its meeting of that year.

A new faculty was organized, of which John S. Marshall became the dean, and its equipment was materially improved. The educational department was placed in charge of Dr. Cigrand and the business affairs were left to Dr. Menges. Under this management the school prospered and its classes increased greatly. At the end of the first year Dr. Marshall resigned as dean and was made professor of oral surgery. Dr. Ottofy succeeded him as dean and held this position until the transfer of the school to Northwestern University. The classes of this school had increased so greatly that in the spring of 1895 it was necessary to move to more extensive quarters. These were found in a five-story building at the southeast corner of Madison and Franklin streets. In June of that year the building was badly damaged by fire, which necessitated the re-equipment of the dental school including the installing of a hundred of the most approved Wilkinson and Columbia operating chairs.

This school had conferred the degree of D. D. S. on 192 of its graduates, and, in October, 1895, began its course with an enrollment of 403 students, which under the transfer to Northwestern University became students of its dental school and the members of its graduating class were awarded the diplomas of the university on April 6, 1896.

The faculty was again reorganized, a part of each of the old faculties being retained. The new faculty at the beginning of 1896-97 was composed of Edgar D. Swain (dean), G. V. Black, George H. Cushing, Thomas L. Gilmer, J. S. Marshall (emeritus), B. J. Cigrand, A. H. Peck, E. H. Angle, Edmund Noyes, I. B. Crissman, W. E. Harper, G. W. Haskins, James H. Prothero, G. W.

Schwartz, William Stearns, Charles B. Reed, F. B. Noyes, T. B. Wiggin, W. T. Eckley, L. B. Haymen, George Leininger, C. E. Sayre, V. J. Hall and Theodore Menges (secretary and business manager). The dental school was removed to the building that had been occupied by the American College of Dental Surgery, on the corner of Franklin and Madison streets, where it remained until the summer of 1902. The American College went out of existence and, as its students would have no alma mater, it was agreed that those students who graduated from that college in 1890 and later could be made alumni of Northwestern University Dental School.

Northwestern University Dental School now undertook to teach all of the departments, including the fundamental branches, by its own professors and instructors, thus separating them entirely from the medical school. The work was now with much larger classes than had before been assembled in dental schools, and as the year passed it was seen that while the general methods of instruction in vogue were well adapted, much improvement in the systematizing of the work of the teaching force was desirable. At the end of the year the dean, Edgar D. Swain, resigned. G. V. Black was appointed to succeed him and was charged especially with the systematizing of the methods of instruction. Each of the departments of instruction was gradually brought under the control of a single responsible professor, who controlled the methods of presentation of the subjects in his field of work by those associated with him, and the course of study was so graded that the classes of each year remained separate in the classrooms. Personal teaching was provided for by the separation of classes into sections, and the arrangement of quiz masters and demonstrators for special duties, so that the individual student could at any time obtain a personal answer to his questions or the demonstration of a technical procedure.

In 1898 the Northwestern College of Dental Surgery was purchased, the college closed and its plant added to Northwestern University Dental School. This arrangement included the recognition of the recent graduates of this college as alumni of Northwestern University Dental School.

The school prospered and the classes increased in number steadily until, in 1899-1900, there were six hundred students enrolled. In 1899 an entire additional floor was added to gain additional space for necessary classrooms, lecture rooms, and laboratories, and also to provide space for a library, museum, and reading room. It has been found particularly desirable that students be provided with well-arranged space in the school building, to which they could go during any leisure hour for the purpose of reading and study, or which

they could occupy at regular hours and find books upon any topics in dentistry. The work of assembling a library and museum of comparative dental anatomy and dental pathology was actively undertaken, and the material has been rapidly brought together, so that at the present time these may be justly regarded as fully supplying the needs of a dental school. To these, members of the profession have contributed books, journals, and specimens liberally, and have in this way very materially aided in the gathering of the collection. Members of the profession are at liberty to use this library.

On June 1, 1900, Theodore Menges, secretary and business manager of Northwestern University Dental School, died after an illness of a little less than one week. He was thus cut off in the midst of robust manhood and mental vigor, while in the active prosecution of the work that seemed to have been allotted to him. His sudden death threw a wave of grief over all connected with the school, its alumni, the dental profession, and all who knew him and the work he was doing. He was an active, energetic, and resistless worker, devoting his life to the upbuilding of the dental profession.

After the death of Dr. Menges the Northwestern University Dental School became the sole property of the university. Dr. William E. Harper was appointed secretary and the school proceeded with its work without other change. At the end of the year A. H. Peck resigned and Elgin MaWhinney succeeded him.

Very soon after the death of Dr. Menges the university moved to obtain a building of its own, for its professional schools that were not already provided for. These comprised the school of law, the pharmacy school, and the dental school. The Tremont house, an old, established hotel of excellent construction, was purchased and rebuilt to adapt it to the purposes of these schools, at a cost approximating \$800,000. It is now known as the Northwestern University building. It is situated on the southeast corner of Lake and Dearborn streets, in the business center of Chicago.

This building was occupied by these schools of the university in the fall of 1902. In the arrangement of the space the dental school was allotted the two upper floors, the fifth and sixth, and space for its chemical laboratories on the second floor. The sixth floor is twenty-four feet from floor to ceiling, and those parts not devoted to the great clinic and lecture rooms are divided, making an additional or seventh floor creating additional space for the use of the dental school. These floors, with the space occupied by the chemical laboratories on the second floor, give the dental school a net floor space of 57,000 square feet. The rooms are ample for the accommodation of 225 students

in each class, and by a little crowding will accommodate 235 or 600 to 700 in the three classes of a three years' course. The clinic room, lighted upon two sides and by skylight its full length and accommodating a hundred and thirty operating chairs provided with fountain cuspidors, brackets and tables, is believed to be the best yet provided for the clinical teaching of dental students, and its central position in the great city of Chicago gives it an abundant clinic. The lecture rooms are especially well arranged. The lighting is entirely from the ceiling, and the walls are so constructed as to eliminate all noises from the streets of this busy down town district. So completely is this accomplished that the lecture rooms are as free from noise as if the city were eliminated.

The oral surgery clinic room, with its waiting room, preparation room, and recovery room for the temporary care of patients needing hospital advantages, is very compact and convenient for the preparation and care of surgical patients. The seating capacity is sufficient for 225 students.

In the spring of 1904, Dr. William E. Harper resigned the position of secretary of the school and of the faculty and Dr. Charles R. E. Koch was appointed by the trustees of the university in his stead.

As students now enter dental schools without previous private preceptorship in a dental office or a knowledge of the business side of dental practice, a lecture course on dental economics was instituted in 1905. This embraces practice building, methods of obtaining and retaining patients, business relations between dentist and patients, fees for dental services, keeping of books of accounts and of records of operations, presentation and collection of accounts, methods of economy in the conduct of an office, and so forth.

Beginning with the session of 1905, this school lengthened the term of instruction to thirty-two weeks of six days each, in a three years' course.

Beginning with 1906, it raised the entrance requirements to the completion of a high school course in an accredited four years' high school, or a preliminary education that shall be the equivalent of such high school course, and which must be certified to by the superintendent of public instruction of a state, or his deputy.

The lengthening of this course and the increased preliminary education required have resulted in greatly diminished classes, but notwithstanding this fact and a decreased income by reason of it, the trustees of the university and the faculty of the school have determined to adhere to this arrangement, believing that in this way more efficient dentists will be educated to serve the public and that the professional standard of dentists will be elevated.

The curriculum of the school is as follows:

- I. Anatomy, lectures and dissections, first and second years.
- II. Physiology, lectures first and second years.
- III. Histology, lectures and laboratory, first and second years.
- IV. General Pathology, lectures, second year.
- V. Chemistry, lectures and laboratory, first and second years.
- VI. Comparative Anatomy, lectures and museum work, second year.
- VII. Materia Medica and Therapeutics, lectures, demonstrations, second year.
- VIII. Prosthetic Dentistry.
 - (a) Prosthetic technics, lectures, first year.
 - (b) Advanced technics, infirmary practice, lectures, second year.
 - (c) Porcelain technics, lectures, third year.
- IX. Orthodontia, lectures and laboratory, third year.
- X. Operative dentistry and bacteriology.
 - (a) Dental anatomy and operative technics, lectures and laboratory, first year.
 - (b) Technical procedures in filling teeth, lectures—demonstrations—infirmary practice, second year.
 - (c) Pathology of dental caries and its treatment, lectures—demonstrations—infirmary practice, third year.
- XI. Special pathology and therapeutics, Diseases and treatment of the dental pulp, periodontal membranes and contiguous soft parts, lectures—demonstrations—infirmary practice, third year.
- XII. Oral Surgery.
 - (a) Lectures.
 - (b) Exercises in diagnosis.
 - (c) Lectures and demonstrations on anaesthetics.
 - (d) Extracting clinic.
 - (e) Surgical clinic.
 - (f) Infirmary practice, third year.
- XIII. Dental ethics and jurisprudence, lectures, third year.
 - (b) Dental economics.

The alumni of this school, now comprising over 2,500 members, are distributed all over the civilized world. The Alumni Association holds a clinic annually, and publishes a quarterly journal known as the "Northwestern Dental Journal." This has been sustained for six years and is well supported by the alumni board.

The following constitute the faculty of Northwestern University Dental School at the present time, 1908:

- ABRAM WINEGARDNER HARRIS, SC. D., LL. D., President of the University.
 GREENE VARDIMAN BLACK, M. D., D. D. S., SC. D., LL. D., Dean; Professor of Operative Dentistry, Pathology and Bacteriology.
 THOMAS LEWIS GILMER, M. D., D. D. S., Professor of Oral Surgery.

ELGIN MAWHINNEY, D. D. S., Professor of Special Pathology, Materia Medica and Therapeutics.

EDMUND NOYES, D. D. S., Professor of Dental Jurisprudence and Ethics.

JAMES HARRISON PROTHERO, D. D. S., Professor of Prosthetic Technics, Prosthetic Dentistry and Metallography.

FREDERICK BOGUE NOYES, A. B., D. D. S., Professor of Histology.

TWING BROOKS WIGGIN, M. D., Professor of Physiology and Pathology.

GEORGE AMOS DORSFY, PH. D., Professor of Comparative Anatomy.

CHARLES LEWIS MIX, A. M., M. D., Professor of Anatomy.

IRA BENSON SELLERY, D. D. S., Professor of Orthodontia.

HARRY MANN GORDIN, PH. D., Professor of Chemistry.

ARTHUR DAVENPORT BLACK, B. S., M. D., D. D. S., Assistant Professor of Operative Dentistry and Assistant in Oral Surgery.

EUGENE SHAW WILLARD, D. D. S., Assistant Professor of Operative Dentistry and Bacteriology.

FRED WILLIAM GETHRO, D. D. S., Assistant Professor of Operative Dentistry and Dental Anatomy.

HARRY ISAAC VAN TUYL, B. S., M. D., D. D. S., Assistant Professor of Anatomy.

HERMAN DURAND PETERSON, M. D., Lecturer on Anaesthesia and Assistant in Oral Surgery.

CHARLES RUDOLPH EDWARD KOCH, D. D. S., Lecturer on Dental Economics and Secretary of the School and of the Faculty.

HERBERT ANTHONY POTTS, M. D., D. D. S., Lecturer on Anæsthesia and Assistant in Oral Surgery.

BAKER, CHARLES REEDER, D. D. S., Clinical Instructor in Orthodontia.

BIRKLAND, JAMES WILLIAM, D. D. S., Clinical Instructor in Operative Dentistry.

LOUDERBACK, ANDREW VACHEL, M. S., D. D. S., Instructor in Histology and Bacteriology.

MACFARLANE, GEORGE BUCHANAN, D. D. S., Clinical Instructor in Operative Dentistry.

METHVEN, HUSTON FRENCH, D. D. S., Instructor in Prosthetic Dentistry.

POUNDSTONE, GEORGE C., D. D. S., Assistant in Materia Medica and Therapeutics.

WALDBERG, BENJAMIN, D. D. S., Superintendent Prosthetic Laboratory.

SOUTHERN DENTAL COLLEGE.

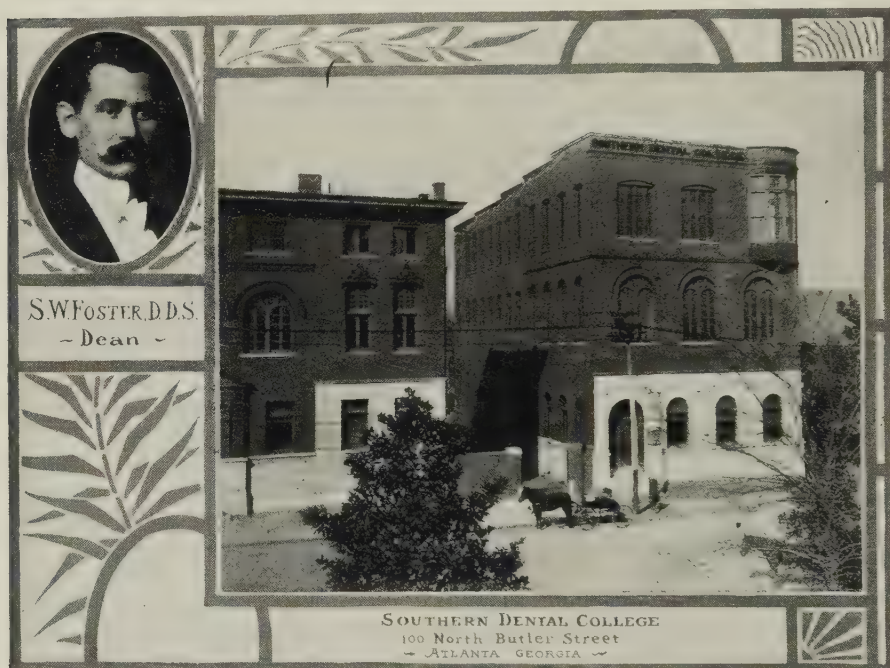
ATLANTA, GA.

BY SHEPPARD W. FOSTER, D. D. S.

The idea of establishing a college for the advancement of dental education in the city of Atlanta, Ga., originated with Dr. Robert A. Holliday, in 1887. Dr. Holliday conferred with Dr. Thomas S. Powell, president of the board of trustees of the Southern Medical College, explaining fully to him the importance of the movement.

After careful consideration of the question by the board of trustees, a favorable report was made and an application made to the Superior Court of Fulton county, Georgia, for an amendment to the charter of the Southern Medical College, making said institution not only a medical college, but a dental college also.

The charter of the dental college was granted in April, 1887, and by the



recommendation of Dr. R. A. Holliday, in conference with other gentlemen, the following curriculum and the professors to fill the various parts of the same were presented to the board of trustees, and by them approved and adopted. The names proposed for professorships were elected to constitute the faculty of the dental college for its first session, 1887-88:

- L. D. CARPENTER, Dean; Professor of Pathology and Therapeutics.
- S. G. HOLLAND, Professor of Chemistry and Metallurgy.
- JOHN S. THOMPSON, Professor of Mechanical and Prosthetic Dentistry.
- WILLIAM CRENSHAW, Professor of Operative Dentistry.
- R. Y. HENLEY, Professor of Oral Surgery and Materia Medica.

WILLIAM P. NICOLSON, Professor of Anatomy.

R. C. WORD, Professor of Physiology.

Work was immediately commenced, and continued very successfully for two years.

At the beginning of the third session the chair of oral surgery and materia medica was dropped by giving oral surgery to the chair of pathology and therapeutics, and materia medica to the chair of dental chemistry. It was also decided that metallurgy be added to prosthetic dentistry.

The faculty elected for the ensuing year was ·

S. G. HOLLAND, Professor of Chemistry and Materia Medica.

J. S. THOMPSON, Professor of Mechanical and Prosthetic Dentistry and Metallurgy.

WILLIAM CRENSHAW, Dean; Professor of Operative Dentistry.

L. D. CARPENTER, Secretary and Treasurer, Professor of Oral Surgery, Dental Pathology and Therapeutics.

W. P. NICOLSON, Professor of Anatomy.

R. C. FORD, Professor of Physiology.

A short time prior to the session 1890-91, Professor R. C. Word was called by the Supreme Ruler of Heaven and Earth to lay down his mantle of renowned usefulness, and pass over the river of death to his eternal reward. Surely a man, good and true, passed from us.

The board of trustees elected Dr. J. C. Olmstead to the chair of physiology left vacant by the death of Professor R. C. Word.

No other change occurred in the faculty until May 23, 1891, when at a called meeting Dr. William Crenshaw resigned as dean, and L. D. Carpenter was again honored by being elected dean.

Early in 1891-92 the faculty, realizing the necessity of more commodious quarters to accommodate the increasing attendance, purchased a building site on Butler street, opposite the Grady hospital, and arranged at once to have erected a modern structure especially designed for the teaching of dentistry.

A short time before the session of 1891-92 commenced, Dr. J. C. Olmsted resigned and Dr. F. W. McRea was elected professor of physiology.

Soon after the close of the session of 1891-92, Drs. William Crenshaw and J. S. Thompson resigned, and Dr. Frank Holland was elected to the chair of operative dentistry and Dr. C. V. Rosser to the chair of prosthetic dentistry and metallurgy. Dr. S. G. Holland also having resigned, his place was filled by the election of Dr. H. F. Harris, professor of chemistry.

At a faculty meeting in July, 1895, Dr. S. W. Foster was made demonstrator-in-chief of clinics and elected to the chair of materia medica, pathology

and therapeutics. Dr. John E. Woodward was elected to the chair of prosthetic dentistry and metallurgy.

At the annual meeting on April 8, 1896, Dr. C. V. Rosser, because of poor health, tendered his resignation to the faculty. The same was received with regret and a vote of thanks extended to Dr. Rosser for the very efficient services rendered the college, and a hope for his speedy recovery.

April 20th, Dr. S. W. Foster was elected dean of faculty and Dr. C. V. Rosser retained as emeritus professor.

In May, 1896, a chair of orthodontia and oral surgery was created and Dr. R. C. Young, of Anniston, Ala., elected to fill that chair. Dr. John E. Woodward resigned as professor of prosthetic dentistry and Dr. W. E. Walker, of Pass Christian, Miss., was elected to the chair of prosthetic dentistry and metallurgy. In 1897 Dr. F. S. Bourns was elected to the chair of histology and bacteriology. In May, 1898, Dr. W. E. Walker resigned and Dr. H. Herbert Johnson of Macon, Ga., was elected to the chair of prosthetic dentistry and metallurgy.

In 1899 the Southern Medical College and the Atlanta Medical College combined and formed the Atlanta College of Physicians and Surgeons, with the Southern Dental College a department of the same. As a result of this combination Dr. Louis H. Jones was elected to the chair of chemistry; Dr. Claude A. Smith to the chair of practical pathology, bacteriology and histology and Dr. J. C. Johnson professor of physiology.

In May, 1903, Dr. Thomas P. Hinman was elected to the chair of oral surgery, X-Ray, orthodontia and porcelain art. In August, 1905, Dr. William S. Goldsmith was elected to fill the chair of physiology. He resigned in May, 1907, and Dr. DeLos Hill was elected to succeed him as professor of physiology.

The present buildings and equipment of the Atlanta College of Physicians and Surgeons represent an investment of about \$225,000.00, including the medical, dental and pharmacy colleges, with an enrollment of nearly 600 students. The dental college buildings and equipment represent an investment of about \$30,000.00, owned exclusively by the faculty. The enrollment for 1906-07 was one hundred and seventy-one. The present (1908) faculty embraces fifteen teachers and demonstrators as follows:

WILLIAM PERRIN NICOLSON, M. D., Professor of Anatomy and Oral Surgery.

FRANK HOLLAND, M. D., Professor of Operative Dentistry and Dental Hygiene.

SHEPPARD W. FOSTER, D. D. S., Professor of Materia Medica, Pathology and Therapeutics.

LEWIS H. JONES, M. D., Professor of Dental Chemistry.

H. HERBERT JOHNSON, D. D. S., Professor of Prosthetic Dentistry and Metallurgy.

THOMAS P. HINMAN, D. D. S., Professor of Orthodontia, Porcelain Art, X-Ray and Oral Surgery.

DELOS L. HILL, D. D. S., Professor of Physiology and Histology.

CLAUDE A. SMITH, M. D., Professor of Practical Histology, Pathology and Bacteriology.

M. D. HUFF, D. D. S., Asst. Professor Materia Medica, Pathology and Therapeutics; Demonstrator Crown, Bridge and Porcelain.

M. F. FOSTER, D. D. S., Demonstrator of Operative Dentistry.

F. E. HEARN, D. D. S., Demonstrator of Operative Dentistry.

J. A. BROACH, D. D. S., Demonstrator of Prosthetic Dentistry.

B. C. WILLIAMSON, D. D. S., Demonstrator of Prosthetic Dentistry.

CLAUDE A. SMITH, M. D., Demonstrator of Anatomy.

GEORGE F. PAYNE, M. D., Demonstrator in Chemical Laboratory.

GEORGE WASHINGTON UNIVERSITY DEPARTMENT OF DENTISTRY.

WASHINGTON, D. C.

BY HENRY C. THOMPSON, D. D. S.

The first course of lectures in the Department of Dentistry of the George Washington University, of Washington, District of Columbia, began in November, 1887, under the title of the "Columbian University Dental Department." The course then extended over two years of five months each. Two years later the course was extended to seven months, and later, in answer to the increasing demand for higher dental education, to three years of eight months each. The present name was adopted in 1904, when Columbian University became the George Washington University.

The university owes its foundation to George Washington, who, in his will probated in 1799, urged the establishment of a university in the city of Washington. Twenty-two years later, in 1821, by an act of congress "The Columbian College in the District of Columbia" was created. A medical school was organized in 1825 and the law school in 1865. The following year Mr. Corcoran gave the medical school a building, at 1325 H street, and in 1872, he gave an endowment "to make the college an university." By act of congress, in 1873, the name of the institution was changed to Columbian University.

Following conferences between representatives of the Washington Memorial Institution, the George Washington Memorial Association and the Colum-

bian University with a view to co-operation in graduate work, congress, in 1904, made the university non-sectarian and gave the board of trustees power to change the name. The George Washington Memorial Association suggested that the name be changed to the George Washington University and offered to erect a memorial building on the new site, at a cost of \$500,000, for graduate study and scientific research. This offer was accepted by the board



of trustees and on September 1, 1904, the name was changed to the present appellation.

The dental building is located at 1325 H street, N. W. It is well equipped in laboratories, class rooms and infirmary, the latter being open every week for nine continuous months, being closed during July, August and September.

Candidates for matriculation must show that they are fitted by previous education to study dentistry, either presenting a certificate from an approved high school or passing an equivalent examination. Candidates for graduation must have attended three full courses of lectures, each of eight months' duration, and three courses of clinical instruction in that department, during the

regular winter term and in separate years. Students are examined at the end of the regular course upon all subjects taught them during that course. The moral character and habits of the candidate, his industry and diligent attendance are also taken into consideration. The student, during and between sessions, must comply with the state laws regulating dentistry, and act in accordance with the recognized code of ethics of the dental profession.

The degrees are conferred by the George Washington University, incorporated by act of congress of the United States.

From 1887 to the academic year of 1907-1908, inclusive, the matriculates in the dental department numbered 460 and the graduates 244. The enrollment in 1907 was fifty-two, including one student from the West Indies.

The dean of the dental department is J. Hall Lewis D. D. S., who is also professor of prosthetic dentistry. The faculty consists of thirty-three members, including professors, instructors, demonstrators and assistants.

The Faculty of the Department of Dentistry now (1908) consists as follows:

CHARLES WILLIS NEEDHAM, LL. D., President of the University.

J. HALL LEWIS, D. D. S., Professor of Prosthetic Dentistry.

HENRY C. THOMPSON, D. D. S., Professor of Operative Dentistry, Dean.

D. KERFOOT SHUTE, A. B., M. D., Professor of Anatomy.

CHARLES E. MUNROE, Ph. D., Professor of Chemistry.

THOMAS A. CLAYTOR, M. D., Professor of Materia Medica and Therapeutics.

JONATHAN R. HAGAN, D. D. S., Assistant Professor of Materia Medica.

JOHN B. NICHOLS, M. D., Professor of Histology.

J. ROLAND WALTON, D. D. S., Professor of Prosthetic Technics.

SHEPHERD IVORY FRANZ, Ph. D., Professor of Physiology.

J. J. KINYOUN, M. D., Ph. D., Professor of Bacteriology and Pathology.

J. R. DE FARGES, D. D. S., Professor of Oral Surgery.

D. WEBSTER PRENTISS, M. D., Assistant Professor of Histology.

HURON W. LAWSON, M. D., Assistant Professor of Bacteriology and Pathology.

E. G. SEIBERT, M. D., Assistant Professor of Chemistry.

W. F. R. PHILLIPS, M. D., Assistant Professor of Practical Anatomy.

NOBLE P. BARNES, M. D., Lecturer on Materia Medica.

S. H. GREENE, JR., M. D., Instructor in Anatomy.

J. L. RIGGLES, M. D., Instructor in Anatomy.

OTIS D. SWETT, B. S., Instructor in Chemistry.

FREDERICK I. BARTLETT, D. D. S., Instructor in Crown and Bridge Work and in Prosthetic Technics.

ARTHUR B. COOPER, D. D. S., Instructor in Porcelain Work.

CHARLES BASSETT, D. D. S., Assistant Professor in Charge of the Dental Infirmary.

GEORGE B. HEINECKE, M. D., Assistant Demonstrator of Anatomy.

W. A. FRANKLAND, M. D., Assistant Demonstrator of Anatomy.

CADMUS LINDEN ODOR, D. D. S., Professor of Operative Technic.

W. FRANCIS LAWRENCE, D. D. S., Demonstrator of Prosthetic Technic.

JOSEPH WOOD POLLOCK, D. D. S., Assistant Demonstrator in the Infirmary.

ARTHUR MILLARD TRIVETT, D. D. S., Assistant Demonstrator in the Infirmary.

WESTERN DENTAL COLLEGE.

KANSAS CITY, Mo.

BY D. J. McMILLEN, D. D. S., M. D.

The existence of the Western Dental College is due to that spirit of enterprise that has been the dominating feature in the upbuilding of the great southwest. Early in 1890 a number of dental and medical practitioners felt the time was right for the establishment of a new dental college in Kansas City, the place in which they had embarked their fortunes and in whose future as the coming metropolis of the great Mid-West they had the utmost faith. Accordingly an organization was effected and a certificate of incorporation was issued by the secretary of state of Missouri on June 24, 1890, duly chartering the Western Dental College.

The first session opened September 14, 1890, and continued for six months. The first faculty consisted of nine regular professors, embracing the subjects of operative dentistry, prosthetic dentistry and metallurgy, dental pathology and therapeutics, anatomy, physiology, chemistry, materia medica, general pathology and therapeutics, and oral surgery. D. J. McMillen was chosen dean of the faculty and has continued in that position since that time.

In addition to the professors there were a number of demonstrators, largely, however, from among the members of the faculty and practitioners of the city. The attendance required for graduation at that time was two years, in common with all other schools, but arrangements were made to increase the term to three years, beginning with 1891, according to the rules of the National Association of Dental Faculties.

The first session opened with an enrollment of sixty students, of whom nine were seniors who graduated in the first class. The enrollment for the second year, 1891-92, was 126, but the change from the two year to the three year course made the number of graduates but seven. Since 1892-93 the enrollment has run from about 150 to 240, averaging about 200 students annually, with graduates numbering from twenty-six to sixty-six a year.

The earlier years of the Western Dental College witnessed several changes in the faculty as might be expected in any new institution of the kind. This

matter soon adjusted itself and the course of instruction was early arranged after a definite plan, which was to make every department as practical as possible. Laboratory courses were extensively provided for, considering the advancement of that plan of teaching at that time. The courses in prosthetic and operative technics were made especially complete.

The Western Dental College takes some pride in the fact that it was the first



institution to advocate carving of bone teeth, D. J. McMillen being the originator and carving the first specimen set for college use in the teaching of dental anatomy, the teeth being used also for the purpose of preparing cavities and inserting fillings in the work of operative technics. This plan of teaching operative technics was given to the profession at a meeting of the National School of Dental Technics at Saratoga Springs, N. Y., in 1896, in a paper by Dr. William J. Brady, which was published in the proceedings of that body.

Dr. D. J. McMillen gave much personal attention to the college from the first and in 1897 retired from active practice to devote all his time to college work. The burden of management has rested largely upon him at all times

and his personal efforts have contributed much to the success of the school. Dr. McMillen enjoys the distinction of being one of the few teachers of the use of non-cohesive gold and has always made this work prominent in his instruction.

The steady growth and continued prosperity of the Western Dental College made several enlargements and changes of quarters necessary, until, in 1900, the directors erected a permanent home at the corner of Eleventh and Locust streets, the building being arranged expressly for college use. The equipment is extensive in all departments. The school has facilities not enjoyed by many older and more pretentious institutions.

The students of the college have largely been drawn from the southwest, principally from Missouri, Kansas, Arkansas, Oklahoma, Texas, Utah, Colorado, Nebraska and Iowa, although almost every state in the Union has been represented in the school at some time. These students have usually returned to their native states after graduation and have met with more than the usual share of success, as the percentage remaining in practice is above the average. The number of graduates to date is 756, of whom eighteen are deceased and 738 are in practice, according to the best information available. There have been nineteen women graduates, of whom six are now in active practice.

In the eighteen years of its existence the Western Dental College has kept pace with the progress of dental education in the United States. The school has long been a member of the National Association of Dental Faculties and has been represented in that body every year of its membership by the dean, who has aided in much beneficial legislation in this association.

The faculty of the college now numbers fourteen active professors, six lecturers and nine regular demonstrators, four of whom give all their time to this work. The spirit of friendly co-operation is especially prominent among all these teachers, as well as firm belief that the greatest good comes to the greatest number from teaching common, every day, practical dentistry in a practical way.

The faculty is now (1908) composed as follows:

D. J. McMILLEN, M. D., D. D. S., Professor of Operative Dentistry, Dean of Faculty.

HARRY B. McMILLEN, D. D. S., Professor of Prosthetic Dentistry and Secretary of Faculty.

F. G. WORTHLEY, D. D. S., Professor of Dental Pathology and Therapeutics.

U. S. HOUGLAND, D. D. S., Clinical Professor of Porcelain Crown and Bridge Work.

WILLIAM J. BRADY, D. D. S., Professor of Orthodontia and Dental Anatomy.

W. F. KUHN, A. M., M. D., Emeritus Professor of Physiology.

L. G. TAYLOR, A. M., M. D., Professor of Physiology.

GEORGE HALLEY, M. D., Emeritus Professor of Oral Surgery.

EARNEST ROBINSON, M. D., Professor of Oral Surgery.

J. T. MITCHELL, A. M., M. D., Professor of Anatomy.

A. M. WILSON, A. M., M. D., Professor of Materia Medica, General Pathology and Therapeutics.

WALTER M. CROSS, A. B., M. D., Professor of Chemistry and Director of Chemical Laboratory.

H. P. KUHN, A. B., M. D., Professor of Histology and Bacteriology, and Director of Histological and Bacteriological Laboratory.

JOHN PUNTON, M. D., Professor of Neurology.

THE CINCINNATI COLLEGE OF DENTAL SURGERY.

CINCINNATI, OHIO.

G. S. JUNKERMAN, A. M., M. D., D. D. S.

The Cincinnati College of Dental Surgery was organized in 1893 by G. S. Junkerman, A. M., M. D., D. D. S., and associates, and in the same year it became an incorporated body under the laws of the state of Ohio. It is purely a dental college in the strictest sense, its entire building being completely equipped for theoretical and practical teaching. It is the rule of the board of trustees that the faculty be composed of dental and medical men of superior attainment and long experience, and, as far as is practicable, each member of the faculty demonstrates his own department of the college clinic and laboratories, thus bringing the student into a very close touch with his teachers.

In 1902 The Cincinnati College of Dental Surgery became affiliated with Ohio University, becoming the dental department of this institution, which enjoys the distinction of being the oldest educational institution west of the Allegheny Mountains. The diplomas of the dental department are signed by the president and secretary of the University and receive its official seal, besides the signatures and the seal of the college itself.

Dr. G. S. Junkerman was made dean at the inception of the college and has occupied this important position up to the present time. His entire time is given to college work and through his persistent and indomitable force the college was brought through its early struggles to the enviable position which it holds today.

This college has nine members in its faculty, four of whom were elected to their respective chairs at the time of organization. The members of the faculty are severally members of important state and national dental and medical societies.



The Cincinnati College of Dental Surgery is a member of The National Association of Dental Faculties and complies strictly with its rules and regulations, and is vested with the authority to confer the degree of Doctor of Dental Surgery.

The faculty is now (1908) composed as follows:

G. S. JUNKERMAN, A. M., M. D., D. D. S., Dean of the Faculty.

W. H. GENSLEY, D. D. S., Secretary of the Faculty.

A. V. PHELPS, M. D.

J. STEVENS, D. D. S.

G. E. BRATTEN, D. D. S.

G. H. BAKER, M. D.

CHARLES MAERTZ, D. D. S.

E. M. BAEHR, M. D.

GREAR H. BAKER, D. D. S.

CHARLES T. SOUTHER, M. D.

D. E. WEAVER, D. D. S.

H. O. VALENTINE, D. D. S.

W. T. McLEAN, A. M., M. D., D. D. S.

DENTAL DEPARTMENT UNIVERSITY OF BUFFALO.

BUFFALO, N. Y.

BY GEORGE B. SNOW, D. D. S.

The original idea of founding a dental college in the city of Buffalo belongs to the late Dr. George E. Hayes. About fifty years ago he prepared a room in a building on the corner of Main and South Division streets, which he occupied as an office and residence, to be used as a lecture hall for a dental college. He was not successful in obtaining the necessary encouragement, and so nothing further was done.

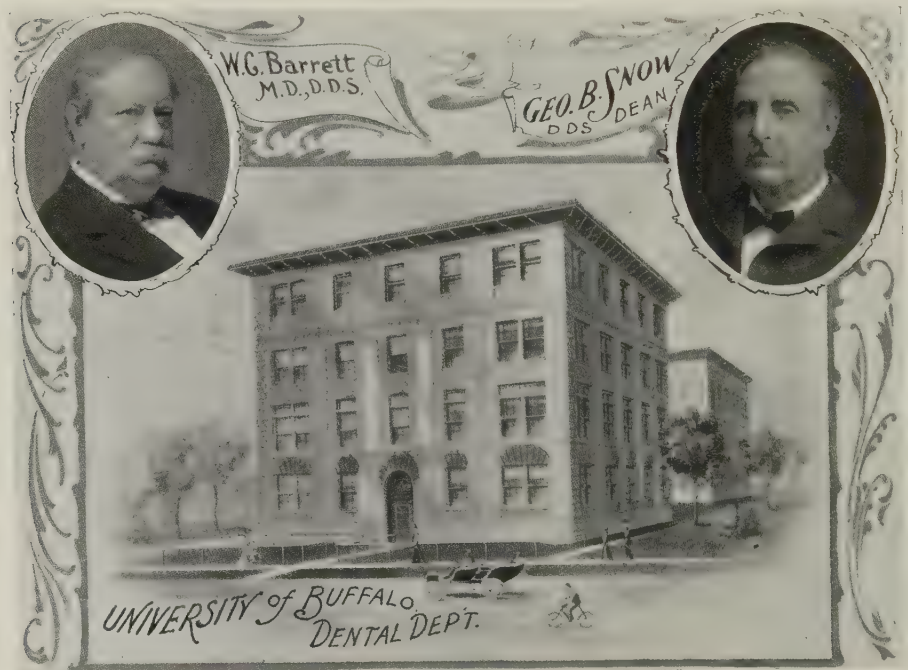
In 1868, the Eighth District Dental Society of the State of New York had a meeting in Buffalo to consider the propriety of establishing a dental college in that city, and appointed a committee, of which Dr. W. C. Barrett was a member, to formulate a plan. The time did not seem to be ripe for the project and, after thoroughly canvassing the subject, the committee concluded that the encouragement given did not warrant the undertaking. Again, in 1888, an effort was made to establish a dental department in the University of Buffalo, but not until 1892 was the school organized and announced.

At that time the council of the university appointed a governing faculty, consisting of William C. Barrett, M. D., D. D. S., professor of the principles and practice of dentistry and of oral pathology; Alfred P. Southwick, M. D. S., professor of operative technics; Franklin E. Howard, M. D. S., professor of operative dentistry, and Herbert A. Birdsall, M. D., D. D. S., professor of dental materia medica and therapeutics. William C. Barrett was elected dean, Alfred P. Southwick, secretary and treasurer and Herbert A. Birdsall registrar. This board was given authority by the council to organize the school and appoint such other teachers as in their judgment might be advisable.

When the time came for the opening of the first term of the newly organized department, September, 1892, the new building of the medical department on High street was not sufficiently advanced for occupancy, and the dental department secured rooms on the third and fourth floors of the building at 641 Main street.

Early in the first school year, December 12, 1892, the promising career of Professor Birdsall was cut short by death. Dr. Eli H. Long was appointed lecturer in his place, and in due time was elected to the chair and a position upon the governing faculty.

The number of students who applied for entrance, forty-six, (five of whom were seniors) was greatly in excess of what had been anticipated, and it was found necessary to take additional rooms in the building adjoining. In February the school was moved to what was supposed to be its permanent quarters in the west wing of the new building on High street built for and by the medical department. Before the end of the term, however, it was discovered that



the provision was insufficient. During the summer months additional rooms were rented on Goodrich street, but the second term found it crowded as much as it was during the first, for the number of matriculates had almost doubled. In the spring of 1896, lots on Goodrich street of sufficient size for a spacious structure, immediately adjoining the medical department of the university, were purchased, and here in the fall of the same year the department took up its abode in a new building, and erected at a cost of \$36,000, especially designed and equipped for a modern and rapidly growing dental college.

The growth of the school was phenomenal, and four years after the beginning the registration of students was 222, and in ten years it was 261.

Early in 1896, Professor Howard asked to be retired, and Rudolph H. Hofheinz, D. D. S., of Rochester, was selected as his assistant, Professor Howard still retaining his place on the governing board. At the same time the chair of prosthetic dentistry was made a council chair, and Dr. George B. Snow, who was the lecturer in charge of the position, was elected to the board. Before the opening of the term for 1897-98, Professor Howard was, at his own request, given an emeritus position, and Doctor Hofheinz was elected professor of operative dentistry in his place.

The next break in the ranks of the faculty came by the death of Dr. Alfred Porter Southwick, who filled the position of professor of operative technic and superintendent of the infirmary, which occurred June 11, 1898. In his death the college suffered an almost irreparable loss. He was a very efficient teacher and a wise counsellor.

The new building erected in 1896 proved to be too small for the needs of the institution and, in 1901, a fourth story was added. This proved to be a wise move and the accommodations afforded by the building are now not to be surpassed by that of any similar institution in the country.

In the winter of 1902-03 it became apparent that the health of the dean, Dr. Barrett, was failing. In the ensuing summer he took an European trip in hopes of receiving relief. But it was of no avail, and he died on August 22, 1903, at Bad Nauheim, Germany. He was so well known to the dental profession by his energy and ability, that it is scarcely necessary to eulogize him here. It will be sufficient to say that his loss was deeply felt by his colleagues.

Dr. George B. Snow was elected dean of the department after the death of Dr. Barrett, and now holds that office. The general faculty comprising all the teachers numbers twenty-nine. Many of these have been connected with the school almost from the beginning and much praise is due them for their self-sacrificing efforts on its behalf.

The aim of those in charge has been, from the first, to introduce improvements in the methods of teaching and to add the equipment therefor whatever seemed to be necessary. Not a year has passed which has not brought a substantial change for the better, in some way, in the course of instruction, and future improvements in the methods and the scope of the teaching are now being planned. And as the field to be covered by the instruction has broadened, the standards to be reached by the students have been correspondingly raised. More is expected from them in the way of work in the infirmary and laboratories, and the examinations are made more strict, so that they may go forth, at the end of the course, better fitted for their life work.

This school has graduated over 700 of its students. The faculty at the present time (1908) is as follows:

F. E. HOWARD, M. D. S., Emeritus Professor of Operative Dentistry.

C. F. W. BOEDECKER, D. D. S., M. D. S., Berlin, Germany, Emeritus Professor of Embryology.

GEORGE B. SNOW, D. D. S., Dean, Professor of Prosthetic Dentistry.

ELI H. LONG, M. D., Professor of Dental Materia Medica and Therapeutics.

R. H. HOFHEINZ, D. D. S., Rochester, N. Y., Professor of Operative Dentistry.

DANIEL H. SQUIRE, D. D. S., Professor of Anatomy; Adjunct Professor of Operative Dentistry.

ROSWELL PARK, A. M., M. D., Professor of Oral Surgery and Surgical Pathology.

G. A. HIMMELSBACH, M. D., Professor of General Anatomy.

THOMAS B. CARPENTER, M. D., Professor of Chemistry and Metallurgy.

LEUMAN M. WAUGH, D. D. S., Professor of Special Pathology and Histology.

V. H. JACKSON, M. D., D. D. S., New York City, Professor of Orthodontia.

GEORGE J. HALLER, M. D., Professor of Physiology.

G. W. WENDE, M. D., Professor of Dermatology and Syphilography.

CHARLES K. BUELL, D. D. S., Professor of Crown and Bridge Work, and Porcelain Work.

THOMAS A. HICKS, D. D. S., Adjunct Professor of Histology and Embryology.

W. H. SNIDER, D. D. S., Lecturer on Dental Materia Medica.

WILLIAM G. BISSELL, M. D., Lecturer on Bacteriology.

MORTIMER L. FAY, D. D. S., Lecturer on Orthodontia.

MARSHALL CLINTON, M. D., Lecturer on Oral Surgery.

ALBERT E. WOERNERT, M. D., Lecturer on General Pathology.

JAMES W. PUTNAM, M. D., Lecturer on Special Nervous Diseases.

ALBERT W. PLUMLEY, Lecturer on Jurisprudence.

GUY M. FIERO, D. D. S., Lecturer on Dental Anatomy.

KARL F. EXCHELMAN, D. D. S., Instructor in Anatomy.

JAMES A. GIBSON, M. D., Demonstrator of Anatomy.

DEMONSTRATORS.

E. S. PACKWOOD, D. D. S.; M. D. LEONARD, D. D. S.; H. F. TANNER, D. D. S.;
A. HOFFMAN, D. D. S.; J. R. HICKS, D. D. S.; O. M. SKINNER, D. D. S.

STARLING-OHIO MEDICAL COLLEGE, COLLEGE OF DENTISTRY.

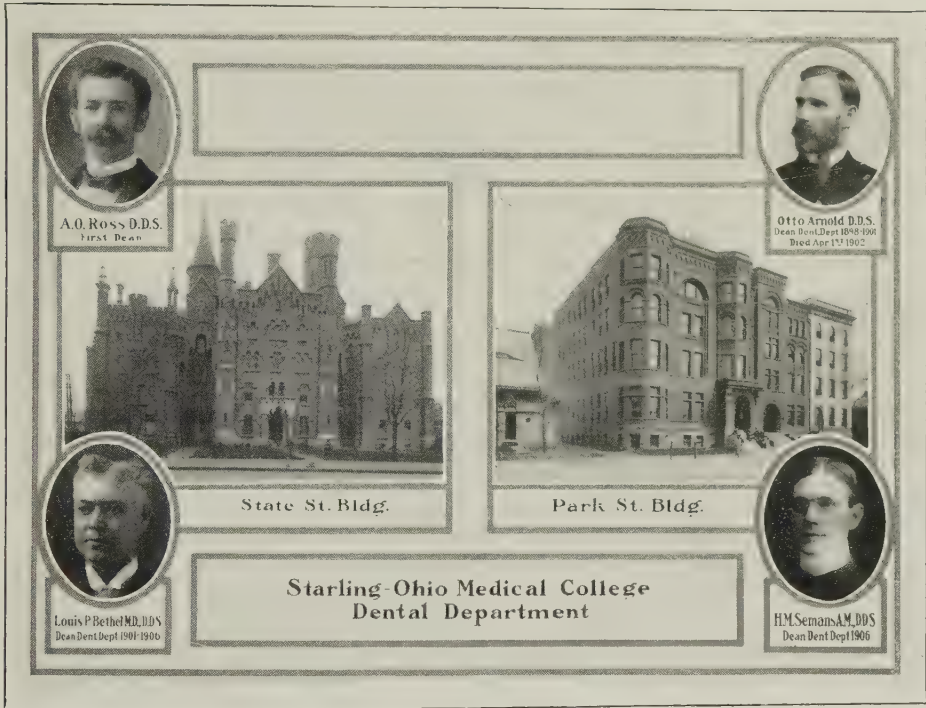
COLUMBUS, OHIO.

BY HARRY M. SEMANS, D. D. S.

The Starling-Ohio Medical College is the result of the merging of the Starling Medical College, well known for sixty years to the medical profession of

this country, and the Ohio Medical University, an institution incorporated in December, 1890. This union of the two took place in June, 1907.

This institution for the present will be governed by a board of trustees composed of twelve men, W. C. Thompson, D. D., L. L. D., being president. Dr. Thompson is president of the Ohio State University. Charles S. Hamilton, formerly dean of the Starling Medical College, is chancellor. W. R. La-



zenby, M. Ag., is secretary. Professor Lazenby is professor of horticulture in the Ohio State University. W. J. Means, M. D., treasurer, was formerly treasurer of the Ohio Medical University, and William M. Mutchmore, formerly registrar of the same, is registrar of the new institution. Other members of the board are Frank Winders, M. D., ex-secretary of the Ohio Medical Board of Registration and Examination; E. B. Kinhead, professor of law, Ohio State University; Drs. J. E. Brown, C. F. Clark, T. C. Hoover, Messrs. H. J. Booth and F. J. Heer.

The dental department of the institution was formerly the College of Den-

tistry of the Ohio Medical University, and its first session opened September 7, 1892, with an enrollment of thirteen. The first class graduated was composed of two members. From the start the dental college experienced unvaried success and today, after fourteen years, has an enrollment of 528 graduates. For the session of 1907-08 there were enrolled 106 students in all classes.

The first duly organized faculty was composed of the following:

A. F. EMMINGER, D. D. S., Dean, Professor of Principles and Practice of Dental Science.

A. O. ROSS, D. D. S., Professor Operative Dentistry and Oral Surgery.

G. A. BILLOW, D. D. S., Professor Dental Materia Medica and Therapeutics.

C. A. ECKERT, D. D. S., Secretary, Professor Prosthetic Dentistry.

JAMES SILLCOOT, D. D. S., Professor Metallurgy, Crown and Bridge Work.

J. H. BEAL, PH. D., Professor Chemistry and Pharmacy.

W. L. DICK, M. D., Professor Osteology and Biological Anatomy.

E. C. MILLS, D. D. S., Lecturer on Orthodontia.

J. C. LAWRENCE, M. S., Professor Circulatory and Visceral Anatomy.

CLOVIS M. TAYLOR, M. D., Professor of Physiology.

C. C. BOLTON, M. D., Microscopy and Histology.

GILBERT H. BARGER, LL. B., Lecturer on Dental Jurisprudence.

J. E. BARICKLOW, D. D. S., Lecturer on Anesthetics.

CHARLES A. AUBERT, B. A., Medical Latin.

STERLING B. TAYLOR, M. D., Demonstrator of Anatomy.

R. W. DAVENPORT, Demonstrator of Crown and Bridge Work.

The fact that the Ohio Medical University was, and the newly merged institution is, maintained under the laws of Ohio for educational purposes only, without profit to shareholders (there being nothing of this nature), has insured a continual improvement in equipment and fine buildings. The State street building, at the corner of State and Sixth streets, is of a beautiful old Norman architectural design, and is used both for didactic and clinical instruction. This building also contains a library of 2,500 volumes. It is adjacent to St. Francis hospital. The park street building, near Buttles avenue, facing Goodale Park, is a very large, substantial structure, containing, with many other features, the dental laboratories and recitation rooms. Back of this building stands a four story building containing the laboratories for histology, bacteriology, dissecting, etc. A building adjoins to the north, and for dental purposes contains the operative clinics, with a very large assembly room on the top floor, used solely for general lectures and social functions.

These Park street buildings are adjacent to the Protestant hospital.

The following gentlemen have served as deans:

A. O. ROSS, D. D. S., from 1893-1898.

OTTO ARNOLD, D. D. S., (deceased) from 1898-1901.

LEWIS P. BETHEL, D. D. S., M. D., (Editor of the Dental Summary), from 1901-1906.

For years the college magazine, the "Phagocyte," has been one of the mediums keeping the student body, faculties and alumni in close touch with each other. All other associations found in other educational institutions, such as the Y. M. C. A., athletics, fraternities, etc., have helped to round out a happy existence to the student. The close relationship of the college with the state university, also situated in Columbus, by members of the latter serving both on the board of control as well as in the faculty of the former, has added to its substantial standing throughout the country.

The following comprise the present (1908) faculty:

C. S. HAMILTON, M. D., Chancellor.

HARRY M. SEMANS, D. D. S., Dean, Professor of Operative Dentistry and Dental Anatomy.

GARRET A. BILLOW, D. D. S., Professor of Dental Materia Medica, Therapeutics and Pathology.

W. J. MEANS, M. D., Professor of Oral Surgery and General Pathology.

JOSIAH MEDBERY, M. D., Professor of Anatomy.

CARL LOUIS SPOHR, M. D., Professor of Bacteriology.

WILLIAM MCPHERSON, PH. D., Professor of Chemistry.

CURTIS C. HOWARD, M. SC., Professor of Chemistry and Toxicology.

HARVEY VAN DOREN COTTRELL, D. D. S., Sec'y, Professor of Prosthetic Dentistry.

ALDEN BUSH, D. D. S., Professor of Crown and Bridge Work, Metallurgy and Orthodontia.

KARL CLARK BRASHEAR, D. D. S., M. D., Professor of Dental Anaesthetics.

RALPH E. WESTFALL, B. S., Professor of Jurisprudence.

RAYMOND J. SEYMOUR, M. D., Professor of Physiology and Histology.

PERRY B. CLARK, D. D. S., Instructor in Operative Technics and Superintendent of Dental Operative Clinic.

WILLIAM I. JONES, D. D. S., Instructor in Porcelain Work.

DESSIE B. THOMPSON, D. D. S., Instructor in Prophylaxis.

EDWARD C. SHERMAN, D. D. S., Instructor in Dental Electricity.

CHARLES D. DENNIS, M. D., Assistant to Chair of Anatomy and Demonstrator of Anatomy.

ROBERT W. DEYO, D. D. S., Assistant to Chair of Prosthetic Dentistry.

IRWIN A. BOTTENHORN D. D. S., Demonstrator in Clinical Dentistry.

CHARLES F. BOWEN, M. D., Radiographer.

HUGH J. MEANS, M. D., Assistant in Oral Surgery.

COLLEGE OF DENTISTRY OF WESTERN RESERVE
UNIVERSITY.

CLEVELAND, OHIO.

BY CHARLES F. THWING, LL. D.

The year of 1892 was a great year in the history of Western Reserve University. In that year were established a school of law, a graduate school and a school of dentistry. At once were added to the university departments a number equal to those already existing—Adelbert college for men, the college for women, and the medical school.

The foundation embodied and still illustrates certain relations. The institutional relation, as intimated, was significant. The Western Reserve University looks back in its origin to the year 1826, when, in the original chapter bearing the name of Western Reserve, the seed of the higher education was first planted. For almost three-quarters of a century the seed thus planted had been growing. Its fruitage was, as the world knows, rich and beneficent. A medical school was founded in 1844 and up to the foundation of the dental school, had, for almost one-half of a century, been giving first-rate education to physicians. In the year 1888, four years previous to the opening of the dental school, the college for women had begun what has since proved to be an illustrious career.

Thus the college of dentistry at once entered into a confederation of schools of the higher learning, having historic significance, and a repute noble and wide.

Of all the relations, however, that maintained with the medical school was most important and intimate. From the beginning of the dental school it was determined to interpret and to use the science and art of dentistry as a department of medicine. In such fundamental branches, therefore, as physiology, anatomy, chemistry and bacteriology, professors in the medical school became at once teachers in the respective departments of the dental school.

The geographic reasons of the foundation, too, were not, and are not, without significance. The attendance at professional schools and undergraduate colleges in the United States is in no small degree local. One-half of the students of Harvard College are residents of Massachusetts. Northern Ohio is a long distance from central Ohio, and a still longer one from southern Ohio. The distance, too, to the great cities of western Pennsylvania and of western New York was quite as great as to the capital city of Columbus, and to Chi-

cago even greater. Geographic conditions, therefore, contributed to the establishment of the school.

The professional condition, too, was not without value. Cleveland has, for a generation, been recognized as having a great repute for the skill and art of its dental practitioners. But professional repute, like every type of organization, is subject to the need of constant renewal. It was believed that the estab-



lishment of a school would worthily gather up the professional forces of Cleveland and would enhance the reputation of the city as a place of dental tuition. This belief, it has been proved, had good foundation. The services of some of the oldest and most eminent members of the profession have been given to the school, and the school itself has enhanced the fame of Cleveland as a center of the art and science of dentistry.

The school was opened, therefore, by the direction of the board of trustees of Western Reserve University with the academic year of 1892, in the building of the medical school. The first faculty was composed of the following

Charles F. Thwing, President; Henry L. Ambler, Dean; W. H. Whitslar, Secretary; George H. Wilson, H. F. Harvey, D. R. Jennings, J. R. Owens, H. L. Ambler, John W. Van Doorn, Professors.

The number of students, as the catalogue of the year shows, was twenty-one. In all the years, the attendance has aggregated 1,236 students. The number of graduates is 365.

These men are now practicing in many parts of the United States, though a larger share are still residents of Ohio. In the year 1896, the school was transferred from the medical school building to its own rooms, especially fitted up for its use, in the Bangor building, near the new center of the city. These rooms it still occupies. The largest share of the teaching of the tuition is here given, although certain classes are still conducted in the medical school.

Among the professors who have been connected with the dental school for a longer or shorter period are: Henry L. Ambler, dean of the faculty, 1893; John F. Stephen, H. A. Garfield, John G. Spenser, W. T. Howard, L. P. Bethel, C. S. Case, C. E. Hurd, W. G. Ebersole, W. A. Price, H. C. Kenyon, F. C. Waite, R. G. Perkins, F. A. Henry, D. H. Zeigler, D. A. Wright, V. E. Barnes, J. F. Wark, F. L. Smith, J. H. Turney, J. A. Coates, J. C. McFate, S. H. Monson, J. A. Evans, G. H. Wilson, Frank M. Costo, W. H. Weir, W. S. Hobson, Frank Acker, H. T. Haskins, A. I. Brown, C. H. Clark, C. O. Witter, W. T. Arnos, E. D. Phillips, H. E. Friesell, T. J. McLernon, E. E. Belford, A. I. Ludlow, R. N. Elliott, F. C. Curtis, W. C. Hill, W. B. Gerow, L. H. Simpkins, H. J. Fiedman, Jacob Laisy, Perry L. Hobbs, George N. Stewart, D. P. Allen, Carl A. Hamann.

ATLANTA DENTAL COLLEGE.

ATLANTA, GA.

By WILLIAM CRENSHAW, D. D. S.

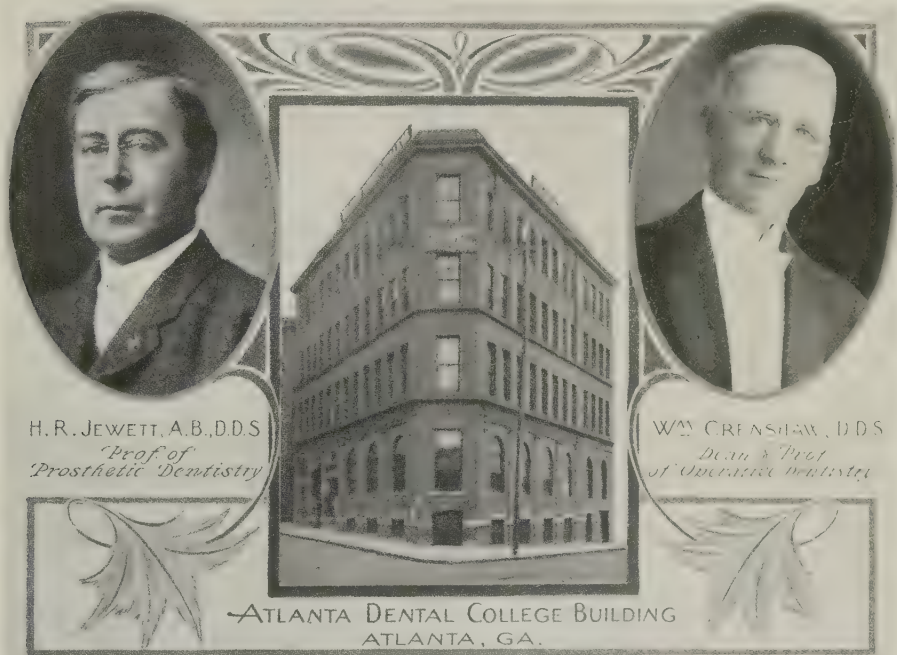
The Atlanta Dental College was organized in 1892, under a charter granted by the state of Georgia. It was believed by its founders that there was need of a school in the south which should stand alone for the teaching of dentistry apart from an institution teaching medicine or other allied sciences.

The success of the school seems to prove the wisdom of the idea of the founders. The first class registered, for the season of 1892-3, numbered 120 students, the largest enrollment, it is believed, at the initial session of any

dental school. The growth of the school has been gradual, but steady—the enrollment for the session of 1906-07 being 253.

The Atlanta Dental College occupies a new building, located within the business district of Atlanta, erected expressly for college purposes. This building contains 24,000 square feet of floor space.

The members of the board of trustees which organized the college were: Judge William R. Hammond, President; Dr. W. W. Landrum, Vice President;



Henry W. Cabaniss, Secretary and Treasurer; W. A. Hemphill, J. G. Oglesby, J. W. English, Joseph Hirsch, Charles C. Cox and Forrest Adair.

The first faculty of the institution was:

WILLIAM C. WARDLAW, D. D. S., Professor of Dental Pathology and Oral Surgery;
Dean of the Faculty.

WILLIAM CRENSHAW, D. D. S., Professor of Operative Dentistry and Orthodontia.

JOHN S. THOMPSON, D. D. S., Professor of Prosthetic Dentistry; Treasurer.

H. R. JEWETT, A. B., D. D. S., Professor of Chemistry and Metallurgy.

THOMAS CRENSHAW, D. D. S., Professor of Dental Materia Medica and Therapeutics.

THOMAS HINMAN, D. D. S., Professor of Dental Histology and Crown and Bridge Work.

R. E. HINMAN, M. D., Professor of Anatomy.

O. L. McDONALD, D. D. S., Professor of Physiology.

The present (1908) faculty of the college is:

WILLIAM CRENSHAW, D. D. S., Dean; Professor of Operative Dentistry and Dental Pathology.

H. R. JEWETT, A. B., D. D. S., Treasurer; Professor of Prosthetic Dentistry and Metallurgy.

THOMAS CRENSHAW, D. D. S., Professor of Dental Materia Medica and Therapeutics.

PERCY T. DASHWOOD, D. D. S., Professor and Demonstrator of Dental Histology and Crown and Bridge Work.

EDGAR EVERHART, A. M., PH. D., Professor and Demonstrator of Chemistry and Bacteriology.

MALCOLM E. TURNER, D. D. S., Professor of Porcelain Work.

R. C. YOUNG, D. D. S., Professor of Oral Surgery and Orthodontia.

HANSELL CRENSHAW, M. D., Professor of Anatomy and General Materia Medica.

EDWARD G. JONES, A. M., M. D., Professor of Physiology.

J. D. CRENSHAW, D. D. S., Professor of Dental Technics and Oral Prophylaxis.

KARL A. FRIESEKE, D. D. S., Demonstrator of Operative Dentistry.

C. N. HUGHES, D. D. S., Demonstrator of Operative Dentistry.

H. R. JEWETT, JR., D. D. S., Demonstrator of Operative Technics and Prosthetic Dentistry.

FRANK K. BOLAND, M. D., Demonstrator of Anatomy.

BIRMINGHAM DENTAL COLLEGE.

BIRMINGHAM, ALA.

BY CHARLES A. MERRILL, D. D. S.

The Birmingham Dental College was organized in 1893 under the laws of the state of Alabama, the organizers being T. M. Allen, D. D. S.; Charles A. Merrill, D. D. S.; R. A. Jones, D. D. S.; A. Eubank, D. D. S.; B. G. Copeland, M. D.; H. N. Resser, M. D.; J. H. McCarty, M. D., and J. A. B. Lovett, D. D. Dr. T. M. Allen was chosen dean of the faculty.

The college received a charter from the state in 1893, but later, by special enactment of the legislature, larger scope and privileges were conferred.

Immediately after organization application was made for membership in the National Association of Dental Faculties. This was granted and the institution has remained a consistent member of that body ever since.

From time to time changes have been made in the personnel of the faculty and officers. The present dean is Dr. Charles A. Merrill. The following are the members of the present (1908) faculty:

CHARLES A. MERRILL, D. D. S., Professor of Dental Pathology and Therapeutics.
M. T. HALEY, D. D. S., Professor of Operative Dentistry.
N. C. GLASS, D. D. S., Professor of Prosthetic Dentistry.
L. A. CRUMLY, D. D. S., Professor of Crown and Bridge Work and Orthodontia.
M. A. COPELAND, M. D., Professor of Anatomy.
E. T. GLASS, M. D., Professor of Materia Medica.
E. P. HOGAN, M. D., Professor of Physiology.
J. E. FRAZIER, D. D. S., Professor of Chemistry.
H. F. TURNER, M. D., Professor of Bacteriology and Histology.
B. G. COPELAND, M. D., Professor of Oral Surgery.
D. J. PONCELE, Professor of Dental Jurisprudence.

COLLEGE OF DENTAL AND ORAL SURGERY OF NEW YORK.

NEW YORK CITY.

BY WILLIAM CARR, M. D., D. D. S.

The college of Dental and Oral Surgery of New York has been created a corporation in the following manner:

The legislature, by chapter 261 of the laws of 1852, constituted William Taylor, J. C. Stewart, Daniel I. Jones, and their associates, a body corporate by the name of the "New York College of Dental Surgery," to be located in the City of Syracuse for the purpose of promoting dental science and instruction in the departments of learning connected therewith. This corporation had power to hold real and personal property to the amount of \$20,000. Its trustees named in the act were William Taylor, J. C. Stewart, Daniel I. Jones, Proctor C. Sampson, David Y. Foot, James Foran, M. M. White, Harvey Baldwin, Elias W. Leavenworth, John Wilkinson, George Geddes, Henry Gregory, George F. Comstock, Charles B. Sedgwick and Thomas B. Fitch. The college had the power to confer the degree of Doctor of Dental Surgery upon persons of good moral character who had attended two full courses of lectures in an incorporated medical or dental college, the last being in this college; and four years of actual practice as a dental surgeon and attendance upon one course of lectures in this college being equivalent to the two courses.



WILLIAM CARR, MD, DDS
DEAN



COLLEGE OF DENTAL AND ORAL SURGERY
OF NEW YORK EAST 35TH ST



FACULTY (1908)

Top Row
Bottom Row

Delaney Walton Ward, Ph.D. Chas. Milton Ford, A.M., M.D. Worthington Seaton Russell, M.D.
Arthur Lessner Swift, D.D.S. Wm. Carr, M.D., D.D.S. Roderick McLean Sanger, D.D.S.

The above mentioned act was amended in 1879 by chapter 451 of the laws of that year so as to allow the college to hold property to the amount of \$100,000, and the following gentlemen were named as the Trustees: Elias W. Leavenworth, Charles B. Sedgwick and Thomas B. Fitch, of Syracuse, Reverend Howard Crosby, D. D., Frederick Sturges, W. P. Prentice, Abram S. Hewitt, Charles F. Chandler, Ph. D., Safford G. Perry, D. D. S., Aaron L. Northrop, D. D. S., Charles Miller, M. D. S., Benjamin Ford and Charles E. Francis, D. D. S., of New York City, and General George B. McClellan, of Orange, New Jersey.

The name of the college was changed to "New York State College of Dental Surgery," and the location was changed from Syracuse to New York City.

Changes in the board of trustees, by death and otherwise, occurred, and in the year 1904, considerable sums having been promised toward the support of the college, an agreement was entered into with the New York Dental School for a consolidation of the two institutions, and the Regents of the University granted an amendment of the Charter allowing the institution to hold property to the amount of \$500,000 for purposes of instruction and the support of a dental hospital; degrees to be granted with the concurrence of the Regents, and the name conferred upon the institution in its charter being the New York College of Dental and Oral Surgery.

Some question having arisen as to the power of the Regents to amend a statutory charter, and objection having been raised by the New York College of Dentistry, an institution incorporated subsequent to the date of this body's original charter, upon the ground that the names were so similar as to create confusion, the old charter was again amended by chapter 78 of the laws of 1905 with the same powers as theretofore and the additional power to affiliate or consolidate with any university or any other dental college or dental school of this state. The consolidation with the New York Dental School was expressly authorized and ratified, and the following trustees were named in the act: William Carr, John Ames Mitchell, Mortimer L. Schiff, Washington L. Cooper, William A. Purrington, Clarkson Cowl, Edward W. Davis, Frederick Edey, John W. Boylston, William H. Hollister, all of whom continue to be trustees of the college at the present time. The name conferred upon the college by this act, which is its present name, is "College of Dental and Oral Surgery of New York."

The faculty at present (1908) consists of:

WILLIAM CARR, M. D., D. D. S., Dean of the Faculty, Professor of Oral Surgery.

CHARLES MILTON FORD, A. M., M. D., Registrar, Professor of Anatomy and Histology.

WORTHINGTON SEATON RUSSELL, M. D., Secretary of the Faculty, Professor of Materia Medica and Therapeutics and of Pathology.

DELANCEY W. WARD, PH. D., Professor of Physics, Chemistry and Metallurgy.

RODERICK M. SANGER, D. D. S., Professor of Prosthetic Dentistry.

CHARLES MILTON FORD, A. M., M. D., Professor of Physiology.

ARTHUR L. SWIFT, D. D. S., Professor of Operative Dentistry and of Dental Pathology and Therapeutics.

WILLIAM JARVIE, M. D. S., Clinical Professor of Dental Materia Medica and Therapeutics.

AARON L. NORTHPROP, D. D. S., M. D. S., Clinical Professor of Operative Dentistry.

ARTHUR L. SWIFT, D. D. S.

WILLIAM B. DUNNING, D. D. S., Lecturers on Operative Dentistry and on Dental Pathology and Therapeutics.

HARRY G. NOLAN, D. D. S., Lecturer on Prosthetic Dentistry.

A. EDWARD DAVIS, A. M., M. D., Lecturer on Diseases of the Eye and Ear.

CLINTON W. STRANG, D. D. S., Lecturer on General Dental Practice.

FLOYD M. CRANDALL, M. D., Lecturer on the Nutrition and Development of Children.

WILLIAM A. PURRINGTON, ESQ., Lecturer on Dental Jurisprudence.

GERALD M. WEST, A. M., D. D. S., Lecturer on Hygiene.

OTTO ERNST, D. D. S., Lecturer on Crown and Bridge Work.

WILLIAM EDWARD WEST, B. A., M. D.; Lecturer on Fractures and Dislocations.

NELSON T. SHIELDS, D. D. S., Lecturer on General Dental Practice.

S. ORMOND GOLDAN, M. D., Lecturer on Anesthetics.

VICTOR H. JACKSON, D. D. S.

FREDERICK C. KEMPLE, D. D. S.

HERBERT W. TAYLOR, A. B., D. D. S., Lecturers on Orthodontia.

ALFRED C. FONES, D. D. S., Lecturer on Oral Prophylaxis and Hygiene.

COLLEGE OF DENTISTRY, UNIVERSITY OF ILLINOIS.

CHICAGO, ILL.

BY G. WALTER DITTMAR, D. D. S.

Prominent in the organization of the Illinois School of Dentistry, now the College of Dentistry, University of Illinois, were Doctors George W. Cook, David M. Cattell, Frank N. Brown, Albert E. Morey, George T. Carpenter, Elmer DeWitt Brothers, L. L. B. and Robert P. Donaldson.

The first meeting contemplating its organization was held about July 1st, 1898.

At a meeting held on August 17th, the name of the new school was



C.E. JONES, B.S., D.D.S.
SECY.



G.W. COOK, B.S., D.D.S., DEAN



D.M. GALLIE, D.D.S.,
PROF. OF OPERATIVE DENTISTRY



COLLEGE OF DENTISTRY
UNIVERSITY OF ILLINOIS



F.E. MOOREHEAD, B.A., D.D.S.,
PROF. OF ORAL SURGERY



F.E. ROACH, D.D.S.,
PROF. OF PROSTHETIC DENTISTRY



G.W. DITTMAR, D.D.S.,
SUPT. OF THE INFIRMARY



Section of Infirmary



E.D. BROTHERS, B.S., LL.B.,
PROF. OF DENTAL JURISPRUDENCE

adopted, Dr. Cattell suggesting that it be called the Illinois School of Dentistry. It was a corporate organization.

The charter was issued August 19th, 1898, signed by James A. Rose, Secretary of State. Dr. Frank N. Brown was elected dean and Albert E. Morey, secretary.

The first location of the school was on the northwest corner of State and Quincy Streets, Chicago, in the rooms previously occupied by the Columbian Dental College.

On October 12th, 1898, the first session began with an enrollment of eighty-eight students.

The following was the first faculty:

FRANK N. BROWN, D. D. S., Dean, Professor of Dental Prosthesis.

DAVID M. CATTELL, D. D. S., Professor of Operative Dentistry and Operative Technics.

GEORGE T. CARPENTER, M. D., D. D. S., Professor of Oral Surgery and Stomatology.

ALBERT E. MOREY, Ph. B., D. D. S., Professor of Materia Medica and Therapeutics.

J. A. MCKINLEY, M. D., Professor of Anatomy.

I. D. RAWLINGS, M. D., Professor of Pathology and Bacteriology.

CHARLES J. DRUECK, M. D., Professor of Physiology.

GEORGE W. COOK, D. D. S., Professor of Histology and Demonstrator of Bacteriology.

S. A. WILSON, B. S., D. D. S., Professor of Embriology and Care of Children's Teeth.

GEORGE E. ROLLINS, M. D., Professor of Chemistry, Anæsthesia and Demonstrator in Chemical Laboratory.

EDSON B. JACOBS, D. D. S., Professor of Clinical Prosthetic Dentistry and Orthodontia.

H. W. GOODERL, Ph. G., D. D. S., Professor of Metallurgy.

ELMER DEWITT BROTHERS, B. S., LL. B., Professor of Dental Jurisprudence.

U. G. WINDELL, M. D., Adjunct Professor of Anatomy and Demonstrator of the Cadaver.

G. WALTER DITTMAR, D. D. S., Superintendent of Infirmary.

JOHN B. PALMER, D. D. S., Demonstrator of Porcelain Dental Art.

P. H. BROWN, D. D. S., Demonstrator of Prosthetic Technics.

R. H. KENNING, M. D., Special Lecturer on Hygiene.

OSCAR DODD, M. D., Special Lecturer on the Care of the Eyes.

I. F. WINEMAN, E. E., D. D. S., Lecturer on Electric Technics.

THOMAS BASSETT KEYS, M. D., Lecturer on Suggestive Therapeutics.

The school had accepted and adopted the rules prescribed by the National Association of Dental Faculties and the rules and regulations of the Illinois State Board of Dental Examiners.

The faculty was composed of a number of experienced dental teachers

and young men possessed of energy and a determination to make this new school a potent factor in the world of dental education. The policy of the school was to give each student personal attention and every possible advantage in practical training. It appreciated fully the necessity of a thorough theoretical foundation and its course in dental technics was exhaustive.

On April 12th, 1899, the first class—twenty-six in number—was graduated.

The success of the first year prompted the management of the new school to change its location to the Yukon Building, S. W. corner of Clark and Van Buren Streets.

This building being new and modern in every way, was admirably adapted for the needs of the rapidly growing young school. The infirmary and laboratories were spacious and unusually well lighted. The equipment was materially enlarged—the latest teaching models, scientific instruments and appliances being added.

Its location on the “elevated loop” where 200,000 people, on elevated and surface cars passed the infirmary doors every day, furnished clinical advantages that were not to be excelled. The faculty was strengthened by the addition of two experienced teachers and dental authors, doctors Elgin MaWhinney and B. J. Cigrand.

The prospect for a good year’s work was in evidence and on Oct. 4th, 1899, the opening exercises of the second session were held. It was during this winter that the committee on new schools from the National Association of Dental Faculties examined and reported favorably on the equipment and work of the Illinois School; and at a regular meeting of this Association, held at Old Point Comfort, Va., July 13th, 1900, this school was elected to full and active membership in said association.

On May 4th, 1900, the second class, consisting of nineteen, received the degree of doctor of dental surgery. During the following summer about 3,000 sq. ft. of floor space was added to the institution, making new laboratories and enlarging the infirmary. On Oct. 4th, 1900, the opening exercises began the third session—118 students matriculated.

On May 4th, 1901, a class of twenty-seven was graduated. During the spring of 1901, authorities acting for the University of Illinois, negotiated the purchase of the Illinois School of Dentistry, it being the desire of Andrew Sloan Draper, President, and the Trustees, to add to the University a dental department. Thus another decided step forward was made by the young school, for it heartily welcomed the support and influence of the great University of Illinois.

The following is a special announcement made, at that time, by the University:

SPECIAL ANNOUNCEMENT.

The University of Illinois takes great pleasure in announcing to the dental profession, the Alumni, undergraduates and other friends of the university, that it has organized a college of dentistry, and in pursuance thereof has acquired all the rights, privileges and equipments of the Illinois School of Dentistry, which has been merged in this department. The trustees in adding this department to the university, do so in the confident expectation that it will reflect credit upon the state of Illinois and the profession of dentistry.

The university has secured for the faculty men of reputation and standing who are known honorably throughout the country in connection with their chosen specialties.

The college of dentistry will occupy its own building, situated on the corner of Harrison and Honore streets, Chicago. This building, formerly occupied by the college of physicians and surgeons (the medical department of the university), and recently partially destroyed by fire, is now being rebuilt, and will be completed and equipped ready for occupancy by the beginning of the school term, October 3, 1901. The building, when completed, will be a five-story stone structure, furnished throughout with new and modern equipment, and will be commodious and complete in every respect. It occupies a prominent location directly opposite the Cook County Hospital, in the very center of the medical and dental district of the city, and is not surpassed as a clinical field for dental instruction. Adjoining the school is the West Side Hospital, and adjacent to it, on the north, is the new medical college building of the University of Illinois, the largest building of the kind in the United States.

The College Building is provided with all modern conveniences. It contains three well lighted, well ventilated amphitheaters, the smallest of which has a seating capacity of 200.

The laboratories are large and complete. They occupy four floors; the smallest is 25x100 feet and will accommodate 120 students. They are provided with desks and lockers and are well adapted to the work for which they are intended. Adjoining the laboratories are preparation rooms for the use of professors and demonstrators. In the department of Pathology, the pathological collections furnish ample material for the bacteriological, as well as the microscopical study of diseased tissues. This laboratory is well supplied with excellent microscopes, immersion lenses, microtomes, incubators, sterilizers and all other necessary apparatus.

The pharmaceutical, historical, chemical and technical laboratories are large and complete and the dissecting rooms of the anatomical department are among the largest and finest in the country.

The operatory or clinical department occupies three fourths of the entire top floor of the building. Large sky-lights, as well as north, east and south

side lights, unobstructed by adjoining structures, furnish those most desirable requisites for a clinic room—good light and ventilation.

Eighty chairs of the latest improved patterns, with fountain cuspidors attached, double decked stands for accommodating students' operating cases, lockers, instrument sterilizers, electric furnaces, electric drop light for each chair and all other necessary equipment furnish the operative, prosthetic and orthodontia sections.

A large reading room furnished with reading tables, book racks, comfortable chairs and other necessary appurtenances is located on the second floor.

The library and museum is in connection with the Quine library of the college of medicine of the University of Illinois, which is adjacent to the college of dentistry. This library is under the care of a trained librarian and assistants.

The faculty was strengthened by men prominent in the professions of medicine and dentistry. Among these were Adelbert Henry Peck, M. D., D. D. S., the late William Thomas Eckley, M. D., D. A. K. Steele, M. D., Oscar A. King, M. D., and James Nelson MacDowell, D. D. S.

Dr. Adelbert Henry Peck was elected dean of this new department of the university and Dr. Bernard J. Cigrand, secretary.

One hundred and thirty-four students matriculated and on October 3rd, 1901, the opening exercises began the first session of the School of Dentistry, University of Illinois. The administration of Dean Peck was short—but most successful. The department experienced a severe loss in his resignation, at the close of the second school year. Owing to the resignation of Dr. Peck, the session of 1903-04 was presided over by Dr. Bernard J. Cigrand, as Acting Dean, and Dr. Charles Erwin Jones assumed the Secretaryship. There were also several other important changes in the faculty.

The vacancy caused by the resignation of Dr. David M. Cattell, who had so ably headed the department of operative dentistry, was most satisfactorily filled by the present incumbent of that chair, Dr. Donald M. Gallie.

Dr. Frank E. Roach, Dr. John P. Buckley, Dr. Clayton M. McCauley and others materially strengthened the teaching force.

Dr. Cigrand was elected dean in the summer of 1904 and it was at this time, during the administration of Thomas Jonathan Burrill, Ph. D., L. L. D., Acting President of the University, that the name of the school was changed to that of the "COLLEGE OF DENTISTRY."

The year 1905 found that distinguished scholar and educator, Edmund

James, Ph. D., L. L. D., president of the University. The dental department met in President James a friend much interested in its welfare.

In 1906 George Washington Cook, D. D. S., was made acting dean of this department, being elected to the deanship the following year. During the first decade of the existence of this institution it has conferred the degree of Doctor of Dental Surgery upon three hundred and seventy-one men and thirteen women.

It has a healthy and energetic Alumnus, with numerous members taking active part in the educational advancement of the profession.

Only three members of the original faculty of the Illinois School of Dentistry have remained active teachers in the institution—the present dean, George W. Cook—Elmer DeWitt Brothers, and G. Walter Dittmar.

The following are the present (1908) officers and faculty of the College of Dentistry, University of Illinois:

OFFICERS OF FACULTY.

EDMUND JANES JAMES, Ph. D. LL. D., President.
 OSCAR A. KING, M. D., Chairman of Committee of Organization.
 GEORGE WASHINGTON COOK, B. S., D. D. S., Dean.
 DANIEL ATKINSON KING STEELE, M. D., LL. D., Actuary.
 CHARLES ERWIN JONES, B. S., D. D. S., Secretary.

FACULTY.

GEORGE WASHINGTON COOK, B. S., D. D. S., Professor of Bacteriology, Pathology and Therapeutics.
 DONALD MACKAY GALLIE, D. D. S., Professor of Operative Dentistry and Operative Technic.
 FINIS EWING ROACH, D. D. S., Professor of Prosthetic Dentistry and Porcelain Art.
 GEORGE WALTER DITTMAR, D. D. S., Professor of Clinical Operative Dentistry and Superintendent of Infirmary.
 CHARLES ERWIN JONES, B. S., D. D. S., Professor of Materia Medica and Therapeutics.
 FEDERICK B. MOOREHEAD, B. S., D. D. S., M. D., Professor of Oral Surgery.
 JAMES ALFRED BURRILL, D. D. S., Professor of Orthodontia.
 OSCAR A. KING, M. D., Professor of Neurology.
 DANIEL ATKINSON K. STEELE, M. D., LL. D., Consulting Surgeon.
 HARRY OSCAR WHITE, M. D., Professor of General and Regional Anatomy.
 JACOB F. BURKHOLDER, M. D., Professor of Physiology.
 FRANK E. WYNEKOOP, M. D., Professor of Histology and Microscopy.
 ELMER DEWITT BROTHERS, B. S., LL. D., Professor of Dental Jurisprudence.
 MATHIAS JOSEPH SELFERT, M. D., Professor of Physical Diagnosis and Anesthesiology.

CHARLES HUMPHREY TREADWELL, M. D., Professor of Chemistry.

LOUIS E. BAKE, D. D. S., Associate Professor of Porcelain and Operative Technology.

LOUIS SCHULTZ, D. D. S., M. D., Adjunct Professor of Oral Surgery.

HENRY C. LEE, Ph. G., D. D. S., Adjunct Professor of Materia Medica.

SPECIAL LECTURERS AND CLINICIANS.

WILLIAM H. HARSHA, M. D., Oral Surgery and General Anesthetics.

SETH E. MEEK, M. S., Ph. D., Comparative Anatomy.

CHIEF DEMONSTRATORS.

GEORGE WALTER DITTMAR, D. D. S., Operative Dentistry.

LOUIS E. BAKE, D. D. S., Porcelain Department—Operative Technic.

DEMONSTRATORS.

Arthur G. Nauman, D. D. S.

Clarence B. Meek, D. D. S.

Edwin Paul Swatek, D. D. S.

Frank Ryan, D. D. S.

Louis Miller, D. D. S.

Louis Schultz, D. D. S., M. D.

William B. Hanelin, M. D.

Henry C. Lee, Ph. G., D. D. S.

Francis Marion Harold, M. D., D. D. S.

Joseph Thomas Woof, M. D.

F. L. Horseman, M. D.

A. W. Freese, M. D.

DENTAL DEPT. DETROIT COLLEGE OF MEDICINE.

DETROIT, MICH.

BY THOMAS J. COLLINS, D. D. S.

The department of dental surgery of the Detroit College of Medicine was organized in 1891. It was largely the work of the late Dr. E. C. Skinner who was secretary of the college at that time. Dr. Skinner was graduated from the department of medicine in 1887. It was for the love of knowledge and not with a view of practicing medicine that he took up that study. For years he practiced law in Detroit, devoting himself to abstract work and amassed a considerable fortune. A man of scholarship and lofty views, he conceived the idea of founding a university in Detroit, using as a nucleus some institution already established, and starting other departments to complete the whole.

The talk of opening a dental department in connection with the Detroit College of Medicine was coldly received by the dentists of Detroit, nor was it looked upon with favor by those in authority at the college. But Dr. Skinner was persistent and in the end won. He was authorized by the board of trustees to start the department.

T. A. McGraw, M. D., president of the college, was appointed dean, and G. C. Shattuck, M. D., D. D. S., secretary, the active management of the department being placed in his hands.

The selection of Dr. Shattuck was a happy one, for it is doubtful if a man of less ability, courage and tenacity of purpose would have been successful.



He at once organized a faculty, securing among others such prominent dentists as Drs. E. C. Moore and J. L. Field. The devotion and loyalty of these men aided him greatly in the work. Both are still members of the faculty.

The subjects common to dentistry and medicine were taught by the regular medical professors.

The first year six students were matriculated. The second year brought a class of twenty. In this year the new wing for the department was completed and equipped with every facility required in a modern dental college.

In 1894 the first diploma was issued. The Michigan State Board of Exam-

iners in Dentistry which had been hostile to the college in its inception thought this a favorable time to embarrass if not to crush it. This they tried to do by refusing to recognize its diplomas.

There is a state law that says, "all dental colleges in Michigan must sustain a course equal or equivalent to that of the dental department of the University of Michigan," and places in the hands of the state board of examiners the power to decide what is "equal or equivalent."

The Detroit College of Medicine was about to take legal action to compel recognition of its dental diplomas when the late Dr. Taft, then dean of the dental Department of the state university, came forward in defence of the college.

Taft was a man of broad culture and great intellectual hospitality. An enthusiast in everything that pertained to dentistry, he looked on dental colleges not as rivals, but as coworkers in advancing the cause of dental education. With other members of the university faculty he came to Detroit, visited the college, noted the work that had been done, and after a thorough examination these men passed resolutions declaring the course of instruction to be equal to that taught at the university.

The state board of examiners, seeing the ridiculous position in which they were placed, withdrew opposition and accepted the college diplomas.

From that time the growth of the college was rapid until the average class numbered between forty and fifty students.

With the increase in attendance it was necessary to add to the staff of teachers. These new instructors were selected from among the alumni.

In 1900 the college extended the course to four sessions of nine months each. This step was taken with the dental department two years in advance of the time the National Association of Dental Faculties decided on a four years' course for dental colleges. When the time arrived that the faculties association thought it advisable to return to a three years' course, the college returned to the old schedule. It, however, had graduated one four year class, being the only dental college in the United States having this honor.

The faculty for 1908 consists of: George L. Field, D.D.S., Emeritus Professor of Clinical Operative Dentistry; Theo. A. McGraw, M.D., Dean, Professor of Principles and Practice of Surgery; H. O. Walker, M.D., Professor of Surgery and Clinical Surgery; G. S. Shattuck, M.D., D.D.S., Professor of Oral Pathology and Clinical Oral Surgery; Daniel La Fert, M.D., Professor of Anatomy; J. E. Clark, M.D., Professor of Chemistry; A. W. Ives, M.D., Professor of Physiology; E. C. Moore, D.D.S., Professor of Prosthetic Dentistry and Mechanical Technics; F. L. Newman, M.D., Professor of Materia Medica and Therapeutics; Angus McLean, M.D., Adjunct Professor of Anatomy; W. C. Martin, M.D., Professor of Histology; T. J. Collins, D.D.S., Professor of Oral Surgery; Don M. Graham, M.D., D.D.S., Secretary; J. S. Hall, D.D.S., Professor of Comparative Dental Anatomy; F. MacDonald, D.D.S., Professor of Operative Dentistry and Porcelain work; and a large staff of Lecturers, Special Instructors and Demonstrators.

MARQUETTE UNIVERSITY DEPARTMENT OF DENTISTRY.

FORMERLY

MILWAUKEE MEDICAL COLLEGE DENTAL DEPARTMENT.

MILWAUKEE, WIS.

BY HENRY L. BANZHAF, B. S., D. D. S.

In the year 1893, Dr. W. H. Earles, Dr. W. H. Neilson and Dr. B. G. Maercklein conceived the idea of organizing a proprietary school of medicine and dentistry in Milwaukee. They recognized the fact that there was a field in Wisconsin for such an institution, and believed that it could be made a success, both as an educational and financial venture. Acting on this conclusion, they set themselves at work and raised a sufficient sum of money to build, what they thought was an adequate building. This structure was forty feet wide and ninety feet long, four stories high and a basement, and on the rear end of the lot on the corner of Ninth and Wells streets. A small hospital occupied the front of this site and was connected with this building, so that it could be used for educational purposes. This building was fitted out with one commodious amphitheatre and one smaller anatomical amphitheatre, connected with a dissecting room on the fourth floor. No provision was made for technic laboratories, but a splendid infirmary was provided on the north end of the building. Dr. B. G. Maercklein, the first dean, believed the place to teach dentistry was on the human subject. The course of instruction was, therefore, largely clinical and very practical, and with a small but well equipped laboratory for chemistry, bacteriology and allied subjects, and the personal attention given to the students in the infirmary, the product of the school was high grade and attracted the attention of the general public. As a consequence, in the second year of its existence, the building had to be enlarged. Another story was added to its height, more lecture rooms and facilities for teaching were added, but the same character of the course was maintained.

As the classes grew in size, it became apparent that existing methods of instruction had to give way to more modern ways of teaching. A technic laboratory had to be provided for, and in 1897 the building was again enlarged and made to cover the entire site, ninety-four by one hundred and fifty feet, and in the new building, ample provision was made for technic laboratories.

The school opened its doors for the admission of the students, on September 26, 1894. A graded course of three years was offered. The first faculty consisted of:

B. G. MAERCKLEIN, D. D. S., M. D., Dean, Professor of Oral Surgery.

HANS B. WIPORG, D. D. S., M. D., Secretary, Professor of Dental Hygiene and Jurisprudence.

F. J. CAMERON, M. D., Professor of Anatomy.

A. S. MITCHELL, PH. C., Professor of Chemistry.

ROBERT MAERCKLEIN, D. D. S., Professor of the Principles and Practice of Dentistry.

B. G. BJORKMAN, M. D., Professor of Physiology.

W. A. EVANS, B. SC., M. D., Professor of Pathology.

A. J. COHN, D. D. S., Professor of Dental Materia Medica and Therapeutics.

V. A. GULEX, D. D. S., Professor of Bacteriology.

REINHOLD E. MAERCKLEIN, D. D. S., Professor of Orthodontia and Clinical Dentistry.



During this period the school was admitted to the National Association of Dental Faculties.

In 1898, on account of pressure of private business, Dr. B. G. Maercklein resigned his position as dean of the faculty, and was succeeded by Dr. G. V. I. Brown, a graduate of the medical department of this school. Under his management the school continued to grow, and the requirements for admission were

raised from no examination up to one year in high school. Dr. Brown retired from the deanship in January, 1902, and was succeeded by Dr. W. H. Carson. He filled the balance of the year in that capacity, when he was succeeded by Dr. Henry L. Banzhaf, a member of the state board of dental examiners, and secretary of that body.

In the fall of 1902, in accordance with the rule of the National Association of Dental Faculties, the school advanced its requirements for admission to two years' high school work. Under this rule, students were permitted one year in which to make up their deficiencies in entrance requirements.

About this time, the State Board of Dental Examiners in Wisconsin, became dissatisfied with this arrangement, and a conflict arose, on account of the college permitting certain students one year in which to make up deficiencies, contrary to the order of the state board. In due time this class was graduated, but the men who had been permitted time in which to make up their deficiencies, were not given a degree, and were advised by the faculty that until the objections which the state board had filed to their graduation, were removed, they would have to wait. This, in effect, was an acknowledgement by the college of the authority of the state board of dental examiners.

Notwithstanding this action on the part of the faculty, on June 30, 1905, the board passed the following resolution: "Resolved, that the Milwaukee Medical College dental department is not a reputable school."

In order to appeal from this determination of the board, the college was granted a review by the circuit court of Milwaukee county. The decision of the circuit court was favorable to the college, but the case was appealed by the board to the supreme court.

On March 20, 1906, the supreme court of Wisconsin rendered its decision, which is of great interest and importance to dental colleges, dental boards and the profession generally. The title of this case was: "The State of Wisconsin ex rel. the Milwaukee Medical College vs. Chittenden, et al." The defendants constituted the State Board of Dental Examiners for Wisconsin. The occasion for this decision was an appeal from the judgment of the circuit court, reversing and setting aside a judgment or determination of the board of dental examiners, made in June, 1905, by which that board, without notice that such action was contemplated, by a single sentence, struck out from the diplomas of the Milwaukee Medical College dental department their vital part, and swept away the standing of the institution acquired after many years of efficient work in preparing applicants for the practice of dentistry. The full force of this resolution is not appreciated by those who are not familiar with the significance which the word reputable has acquired in recent years, as used

in connection with dental colleges. To appreciate fully the importance of the word, its use in statutes regulating the practice of dentistry, and especially in those of Wisconsin, must be noticed.

The act of 1903, which was an amendment to the old law, continued the existing state board of dental examiners as previously constituted; altered somewhat the manner of its appointment, and then made provision as to granting licenses to practice dentistry in the following language:

The State Board of Dental Examiners may, in its discretion, except as otherwise provided in this section, license, without examination, only a graduate of a duly incorporated and, in the judgment of said board, reputable dental college, in which the applicant shall have pursued four full courses of lectures of at least seven months each, and which requires for admission thereto a preliminary education equivalent to that required for entrance to the junior class of an accredited high school, or a graduate from such college who, having attended the last full course in the college issuing the diploma, shall have received his dental education prior to said last course in a dental college having an equal standard as to course of study and preliminary requirements.

By this provision, no graduate of a dental college can be admitted to the practice of his profession without passing an examination conducted by the board of dental examiners, except his college possess certain qualifications, viz.: Due incorporation; reputability; four full courses of lectures of seven months each in separate years; preliminary educational requirements fitting for entrance to the junior class of an accredited high school.

The supreme court in the case under consideration, adhered to a former definition of the word reputable, and enlarged upon it. It also made it clear that the function of the board is, *not to define "reputability,"* but to take the definition as given by the court, and apply it to the facts relating to any particular dental college. If facts be found which fulfill the definition of the word as thus given, then the board must pronounce such college "reputable." The supreme court held that "*reputable*" means "*worthy of good repute or distinction;*" that it means, as used in this law, the possession of facilities for good work in preparing candidates for the dental profession, and the use of such facilities in such manner as actually to accomplish good work. It does not mean the possession of mere reputation, and hence the new institution may be "*reputable*" as well as the old, while the old may fall short of it, because not in fact what it is supposed to be, "*worthy of good repute.*"

This general definition of the word is helped out and fully explained by the decision in showing what is not essential to reputability, and its meaning is illustrated by some of the circumstances of the case under consideration. The Milwaukee Medical College dental department had been adjudged by the board

in September, 1902, and again in June, 1903, to be reputable. Notwithstanding these findings, on June 30, 1905, the board adjudged it to be non-reputable. The alleged grounds for this latter judgment were three, viz.: Violation of the board's rule, prohibiting the taking of students for less than the advertised fees; violation of the board's rule prohibiting colleges from accepting students with permission to make up deficiencies in entrance qualifications during the first year of the course, the board holding such students should be given credit for that year, and should be regarded as regularly matriculated in that year.

The court held that *none* of these matters, *nor all of them together*, affected the colleges's reputability in any degree, and that they found no reasonable basis for the judgment that the college was not reputable. It held that the statute contemplated that entrance requirements might be made up by the student during the first year of his course, in accordance with the custom prevailing generally in educational institutions. It further held that such matters as *fees, entrance requirements and the manner of making up entrance qualifications were matters of internal business management concerning the college alone, and that in making rules designed to control dental colleges in such matters, the board was entirely out of its legitimate sphere of action*. "As well," said the Court, "might the board assume authority to regulate any one of the many mere administrative features of dental colleges, as well as the ordinary examinations during the course, or the particular persons to be employed as instructors, or the test to be applied as to their capability, or the particular person to apply such test, or the compensation to be paid to members of the instructional force."

To sum up, the court decided in the Milwaukee Medical College case: As to reputability: That reputability means the possession of facilities for good work and the actual doing of good work; that reputability has nothing to do with due incorporation; that it has nothing to do with length of course; that it has nothing to do with entrance requirements or the making up of deficiencies in entrance requirements in accordance with the custom among educational institutions in this regard; that it is not affected by the acceptance of students for less than the advertised fees; in general, that it is not dependent upon observance of any rule laid down by the board of dental examiners, designed to regulate the internal affairs of dental colleges.

The decision may be found reported in full in Volume 107 of the Northwestern Reporter, pages 500 to 524 inclusive.

It will be noticed that the question involved was one of principle, and the facts as here recorded in relation to this notable case are offered merely for their

historic value in their connection with our school. A moment's thought will, of course, convince any one that this contest between the state board of Wisconsin and the Milwaukee Medical College worked serious injury to the latter, and came dangerously near annihilating the school, and probably would have done so, but for the loyal assistance of the people of Wisconsin its alumni and student body.

Following the decision of the supreme court, the attendance of the school immediately increased. In January, 1907, Marquette University was organized. This was the result of an affiliation between Marquette College and Milwaukee Medical College. In the fall of 1897, under this affiliation, the school opened its doors with 76 matriculates. Its requirements for admission have been advanced to three years in high school, and beginning with the fall of 1909, to four years of high school work. The course is three years of thirty-two weeks, and six days in each week, with the following branches taught in each year:

First year, Anatomy—(a) General—(b) Dental, Chemistry, Histology, Operative and Prosthetic Technics, Physiology, Materia Medica.

Second year, Anatomy, Physiology, Chemistry, Bacteriology, Pathology, Therapeutics Prosthetic Dentistry and Operative Dentistry.

Third year, Operative Dentistry, Prosthetic Dentistry, Oral Surgery, Special Pathology, Therapeutics, Orthodontia, Physical Diagnosis, Toxicology, Porcelain, Gold Inlay, Syphilology.

As now constituted, it has maintained its membership in the National Association of Dental Faculties, and is recognized by the National Association of Dental Examiners.

The faculty now (1908) consists of:

JAMES MCCABE, President of the University.

THOMAS S. FITZGERALD, Secretary of the University.

W. T. REEVES, D. D. S., Emeritus Professor of Operative Dentistry.

HENRY L. BANZHAF, B. S., D. D. S., Dean, Professor of Operative Dentistry.

B. G. MAERCKLEIN, D. D. S., M. D., Professor of Oral Surgery.

HARVEY N. JACKSON, D. D. S., Professor of Prosthetic Dentistry and Metallurgy.

A. J. KUHNMUECH, D. D. S., Professor of Pathology, Materia Medica and Therapeutics.

W. G. DOERN, M. S., M. D., Professor of Anatomy.

ALBERT H. BRUNDAGE, A. M., M. D., M. S., Professor of Toxicology and Physiology.

R. E. W. SOMMER, Ph. G., Professor of Chemistry.

D. HOPKINSON, M. D., Professor of Histology and Bacteriology.

M. N. FEDERSPIEL, D. D. S., Professor of Orthodontia.

GEORGE H. CARTER, D. D. S., Professor of Clinical Dentistry.

WILLIAM HOPKINSON, D. D. S., Associate Professor of Histology.

B. F. PEISCH, M. D., Associate Professor of Anatomy.

ARTHUR H. SANFORD, A. M., M. D., Associate Professor of Toxicology and Physiology.

ARTHUR A. JENNINGS, D. D. S., Instructor in Porcelain and Gold Inlay Fillings.

O. G. KRAUSE, D. D. S., Instructor in Prosthetic Technics.

M. F. MACRAE, D. D. S., Instructor in Dental Anatomy and Operative Technics.

T. A. HARDGROVE, D. D. S., Lecturer on Special Pathology and Oral Prophylaxis.

R. N. BAUER, Ph. G., Instructor in Chemistry.

GEORGE W. KOEPEL, JR., M. D., Instructor in General Pathology.

GEORGE W. DICKINSON, M. D., D. D. S., Lecturer on Physical Diagnosis and Anesthesia.

W. E. TENNANT, D. D. S., Instructor in Materia Medica and Therapeutics.

ALBERT H. PURDY, M. D., Lecturer on Syphilis.

WILLIAM H. NELSON, Registrar.

It seems impossible for the writer of this history to conclude without a reference at least to Dr. William H. Earles, the founder of Milwaukee Medical College, and the only president the institution ever had. In him the school had a friend and supporter who spared neither pains, time nor money in advancing its interests, both material and educational. Without him it would have been impossible for the school to have made the enviable record which it has.

Dr. Earles died April 28, 1908, mourned and beloved by his confreres and friends.

DEPARTMENT OF DENTISTRY OF THE UNIVERSITY COLLEGE OF MEDICINE.

RICHMOND, VA.

BY W. H. O. McGEHEE, M. D., D. D. S.

The University College of Medicine consists of four distinct schools or departments—viz., medicine, dentistry, pharmacy and nursing, and the history of the department of dentistry is so intimately interwoven with that of the other departments, that it is hard to separate from them. The department of dentistry is an integral part of the University College of Medicine, and yet it is an independent department, separate, distinct, and co-equal with the other departments. Dentistry has always been considered a specialty of medicine in this school, and given the recognition due a specialty of medicine.

The history of the development of the school is one of modest beginnings, small capital, unbounded enthusiasm and unequalled determination to succeed, combined with a firm belief by its founders in the necessity for its existence, and its ultimate success and greatness.

The University College of Medicine was organized and chartered under the laws of the state of Virginia in May, 1893, under the name of the College of Physicians and Surgeons. A few years before its organization, a student in medicine in Virginia could enter upon the practice of his profession after a course of one session. At the time of its organization, medical education was at low tide in the south, a course of two six-months sessions being considered amply sufficient to fit the student in medicine for actual practice in the two schools which were in existence in the state at that time, and there was no



dental school between Washington, D. C., and Atlanta, Ga., or east of Louisville, Ky., or Nashville, Tenn. It was estimated that over one thousand young men passed annually through Richmond on their way north to obtain an education in some branch of medicine. This being the case, it was determined by some prominent and progressive men in Richmond, at the head of whom was Dr. Hunter Holmes McGuire, whose name has been blazoned on the pages of history as a surgeon, writer and teacher, and to whom a monument has been erected in the Capitol square at Richmond, to organize a new school with new ideals, with the three separate departments of medicine, den-

tistry and pharmacy, in order that young men in the south might obtain their professional education along these lines nearer home.

The organization of the school took place during a period of great financial depression, when money was hard to obtain, and new ventures were undertaken with fear of failure. Professional schools throughout the south were having smaller attendance than in many previous years, but this could not dim the courage, nor lessen the enthusiasm of the men who were at the head of the movement.

The medical department was being organized, and Dr. Lewis M. Cowardin, who was considered at the head of the dental profession in the state, was approached and requested to organize a dental department, while Mr. T. A. Miller, a prominent pharmacist of the city, was asked to organize a pharmacy department. The charter was obtained, the former residence of vice president Alexander H. Stephens of the Confederate States was purchased and converted into a college building, and the first session of the College of Physicians and Surgeons began on October 3, 1893, with eighty-three matriculates in medicine, twenty-two in dentistry, and sixteen in pharmacy, making a total of one hundred and twenty-one matriculates, which was beyond the fondest expectations of the most optimistic of the originators of the school.

The building, even for the first session of the school, was found to be inadequate to accommodate the unexpected number of students. There being no endowment and small capital to begin with, the class rooms and laboratories were of the crudest character. One of the largest lecture rooms was located in the former parlor of the old Stephens mansion, and in some instances bed-rooms had been converted into class rooms or laboratories by knocking out a partition here, or cutting a door there.

The original corporators of the college consisted of the following prominent citizens of the commonwealth of Virginia:

Moses D. Hoge, D. D., L. L. D.
 Edmund Harrison, A. M., D. D.
 Lewis Ginter
 Joseph Bryan
 Judge George L. Christian
 P. H. Mayo
 T. C. Williams
 Thomas Atkinson
 Thomas Potts
 R. L. Brown
 Edgar B. Taylor
 Hunter McGuire, M. D., LL. D.

William W. Smith, A. M., LL. D.
 Hon. J. Randolph Tucker, LL. D.
 James B. Pace
 Col. C. O. 'B. Cowardin
 Hon. B. B. Munford
 Charles Watkins
 F. S. Myers
 D. O. Davis
 E. A. Saunders
 Joseph N. Cullingworth
 Stephen Putney
 Joseph A. White, A. M., M. D.

The board of directors for the first year was composed of the following gentlemen:

	Dr. Hunter McGuire, President;
	Lewis Ginter, Vice President;
	Dr. Joseph A. White, Secretary and Treasurer;
John Pope	Col. C. O. 'B. Cowardin
Judge George L. Christian	Thomas Potts
Hon. B. B. Munford	Joseph N. Cullingworth
Charles Watkins	Fred S. Myers
T. C. Williams	Edgar B. Taylor
D. O. Davis	Joseph Bryan

The faculty and adjunct faculty of dentistry for the session of 1903-4 was as follows:

HUNTER MCGUIRE, M. D., LL. D., Professor of Clinical Oral Surgery.
 L. M. COWARDIN, M. D., D. D. S., Professor of Principles and Practice of Dentistry, and Associate Professor of Clinical Oral Surgery.
 CHARLES L. STEEL, M. D., D. D. S., Professor of Orthodontia and Dental Prosthesis.
 HUGH M. TAYLOR, M. D., Professor of Special Surgery.
 J. ALLISON HODGES, M. D., Professor of Anatomy.
 M. D. HOGE, JR., M. D., Professor of Histology and Pathology.
 JACOB MICHAUX, M. D., Professor of Materia Medica and Therapeutics.
 W. S. GORDON, M. D., Professor of Physiology.
 CHARLES H. CHALKLEY, M. D., Professor of Chemistry and Metallurgy.

DEMONSTRATORS.

A. R. BOWLES, M. D., D. D. S., Demonstrator of Operative Dentistry, and Associate Professor of Principles and Practice of Dentistry.
 A. L. STRATFORD, D. D. S., Demonstrator of Prosthetic Dentistry.
 JAMES N. ELLIS, M. D., Demonstrator of Anatomy.

Dr. Lewis M. Cowardin, who was elected chairman of the dental Faculty and who is now dean, has conducted the policy of the department of dentistry since its inception.

Dr. Cowardin realized the importance of the thorough training of students in the fundamental branches, and for this reason dental students were given the same course and examinations in anatomy, chemistry, physiology, and other like branches as the medical students. This being the case, students in the department of dentistry were enabled to complete the full medical course in one additional year after obtaining the dental degree, and more dental graduates took the medical degree from the University College of Medicine, in proportion to the total number of dental students, than from any school in the country.

It was the policy of the school from its inception to maintain high ideals, and to be a leader in dental education in the south, and that policy has been continued to the present day. From the first session, the standard of requirements was higher than that of the National Association of Dental Faculties, and membership in that body was obtained as soon as possible, which took place in August, 1895, and has continued ever since.

Before the beginning of the second session, the corporate name of the college was changed from that of the College of Physicians and Surgeons to that of the University College of Medicine. The college was owned and operated by a joint stock company, being a close corporation consisting principally of the professors who were doing the teaching in the various departments.

During the first two years of the existence of the school the dental laboratory was located in what was formerly the kitchen of the Stephens mansion, and the infirmary was situated in the second floor of the stable, the first floor being occupied by the free dispensaries of the medical department. This will give the reader an idea of the modest beginning of the school, which was entirely without endowment, or outside support, and has always remained so. After two years of continuous success, it was found that the buildings were entirely inadequate for the accommodation of the students, and during the following summer many additions were made.

In August, 1895, the department of dentistry was duly elected a member of the National Association of Dental Faculties. At this time it was found that the course as taught was far above that required by this body, especially in the fundamental branches, and the school was compelled for a while to reduce the course in some of these branches since it was found that it began to lose many students, who discovered that they could get a course in dentistry at other reputable schools, members of the association, with lower requirements, and at less effort on their part.

The school has grown year by year, and additions have been made to the buildings as its growth necessitated. In 1897, the present college building was erected immediately adjoining the old Stephens mansion. It is a large modern structure, four stories high, and is arranged with all the latest conveniences. The lecture halls, five in number, and seating respectively 325, 260, 150, fifty and thirty students, are provided with individual opera chairs for the comfort of the students. The laboratories, ten in number, including the microscopic, chemical, anatomical, physiological, pasteur, pharmaceutical, operative technic, prosthetic technic, porcelain technic and senior prosthetic laboratories, are modern and up-to-date in every respect.

At the present time, the college buildings and the Virginia Hospital, which is now an integral part of the college, and has accommodation for 100 patients, occupy the whole block on Clay street from Eleventh to Twelfth streets, extending back 150 feet on Eleventh and Twelfth streets.

In 1900 the college lost by death its brilliant head and founder, Dr. Hunter Holmes McGuire, who had given his best efforts to the development of the school. His reputation as a surgeon, writer and teacher will live for all time, and his memory has been perpetuated in addition to the erection by the public of a heroic monument, by the erection by the faculty, of the Hunter McGuire Memorial Annex to the Virginia Hospital.

In 1904 the Dental school also lost by death one of its original faculty, Dr. Charles L. Steel, who had done much towards the development of the department. Dr. Steel was an eminent practitioner, a terse writer and an able teacher, and the school lost an eloquent advocate and true friend in his death.

Dr. Charles H. Chalkley and Dr. F. S. Harker, professors of chemistry, and Dr. Benjamin Harrison, professor of materia medica have also passed to the great beyond, and the dental department mourns their loss.

The history of the dental department, as well as that of all the other departments of the University College of Medicine, has been one of growth and development from its organization. In 1904 it was decided that the school had reached its maximum of growth under the old regime, and its mode of government was consequently changed. The stock company was abolished, the stock held by the professors in the institution was donated, and a board of trustees was elected as a governing body, the college now becoming a public institution. At the same time, the Virginia Hospital, which had been in close affiliation with the college, and whose medical and surgical staff consisted of the faculty and adjunct faculty, was bought by the trustees, the two institutions thus becoming one, and having one governing head. Dental students are now being given the advantage of oral surgery clinics in the Virginia Hospital, which are of obvious benefit to young men engaged in the study of dental surgery.

The college has always realized the advantages to be derived from a thorough theoretical course, and a profound knowledge of the fundamental branches of medicine by the dental student.

All examinations and exercises of the department are conducted under the honor system, and the college is proud that its students have adopted this mode of self-government.

Several years ago the authorities of the school became convinced that its courses in the practical work might be improved, and the faculty immediately

set to work to find out what was necessary to improve them. After profound thought and study, visits to other schools and careful comparison of its courses with its sister colleges, it was decided to make extensive changes. It was thought that the first requisite for success in this direction was individual and personal demonstrative instruction to the student. It was believed that under the old system students were not brought into close enough contact with the teacher, and consequently could not receive the necessary instruction in the practical work to make them skillful dentists. It was also recognized that completely equipped infirmary and laboratories were a *sine qua non*.

This being the case, with the beginning of session 1906 and 1907, Dr. W. H. O. McGehee was engaged to take charge of and direct the practical work in the department. Additional laboratory and infirmary equipment was purchased, a new prosthetic technic laboratory was built, and the corps of demonstrators and assistants was enlarged.

The session of 1906-07 proved to be the most successful in the history of the dental department, and necessitated additional changes. The infirmary and laboratories were enlarged, new chairs, electric furnaces, inlay machines, and all necessary and up-to-date appliances were added for the comfort and convenience of the students, and the proper conduct of the teaching.

The department of dentistry feels that dental education in the south has been put on a higher plane, and the status of dentistry, as a profession, has been elevated through many of her faculty and alumni. The department has had 310 matriculates, and has graduated 137 young men to the degree of Doctor of Dental Surgery.

There are several superior advantages which the department of dentistry feels it is now enabled to offer its students.

The first of these is the service of trained teachers who devote their whole time to laboratory teaching.

The second is the complete theoretical course, which includes such advanced subjects as *physical diagnosis* of the heart and lungs, and actual practice in the use of the stethoscope as well as in the actual administration by the student of chloroform, ether, somnoform, nitrous oxide and all general as well as local anesthetics; *prescription writing*; and *dental economics*, in which course the student is instructed in the business conduct of the profession which he is to follow.

The third is the complete development of the technic courses, which include extended practical laboratory exercises in orthodontic technics, porcelain technics, operative technics, prosthetic technics and crown and bridge technics. These courses are taught by Dr. W. H. O. McGehee, the director of the dental

infirmary and laboratories. The Wright Dental Manikin, an invention of Dr. Edwin P. Wright, one of the former professors in the department, is utilized largely in the teaching of the operative technic course.

The infirmary clinic is very large, and has been developed to its fullest extent. More patients apply for operations than can be accommodated, although each student is required to perform a large number of operations each year, the number of these requirements being exact in all the classes. The total average number of operations performed by each student during the session of 1907-8 in the dental infirmary and laboratories was 107 for each student.

Below is a list of the faculty and adjunct faculty and officers of the faculty of the department of dentistry for the session of 1908:

FACULTY OF DENTISTRY.

L. M. COWARDIN, M. D., D. D. S., Dean and Professor of Oral Surgery and Clinical Dentistry.

W. H. O. MCGEEHEE, M. D., D. D. S., Professor of Dental Pathology, Materia Medica and Therapeutics, and Director of Dental Infirmary and Laboratories.

R. L. SIMPSON, A. M., D. D. S., Professor of Dental Surgery and Crown and Bridge Work.

WILLIAM J. COWARDIN, M. D., D. D. S., Professor of Orthodontia.

WILLIAM PILCHER, D. D. S., Professor of Prosthetic Dentistry.

M. B. RUDD, D. D. S., Professor of Metallurgy.

HUGH M. TAYLOR, M. D., Professor of Practice of Surgery and Clinical Oral Surgery.

STUART MCGUIRE, M. D., Professor of Principles of Surgery, and Clinical Oral Surgery.

ROSHIER W. MILLER, M. D., Ph. G., Professor of Chemistry.

A. L. GRAY, M. D., Professor of Physiology.

H. STUART MACLEAN, M. D., Professor of Pathology and Bacteriology.

W. LOWNDES PEPLE, M. D., Professor of Histology, and Director of Microscopical Laboratories.

ROBERT C. BRYAN, M. D., Professor of Anatomy.

ADJUNCT FACULTY OF DENTISTRY.

LECTURERS.

WILLIAM J. COWARDIN, M. D., D. D. S., Lecturer on Crown and Bridge Work.

M. B. RUDD, D. D. S., Lecturer on Dental Ethics, Jurisprudence and Economics.

W. H. O. MCGEEHEE, M. D., D. D. S., Lecturer on Physical Diagnosis and Anesthetics.

JAS. W. HENSON, M. D., Lecturer on Principles of Surgery.

K. S. BLACKWELL, M. D., Lecturer on Bacteriology.

WORTLEY F. RUDD, Ph. B., Lecturer on Chemistry.

B. L. HILLSMAN, M. D., Lecturer on Anatomy.

DENTAL DEPARTMENT BALTIMORE MEDICAL COLLEGE.

BALTIMORE, MD.

BY J. W. SMITH, D. D. S.

About May 1, 1895, Dr. J. W. Smith called upon Drs. David Streett, Wilmer Brinton, T. A. Ashby and R. H. P. Ellis with reference to organizing a dental department of the Baltimore Medical College. About a week later a committee, composed of Drs. Merrick, Brinton and Ashby, was appointed by the faculty of the college to confer with Dr. J. W. Smith. At the meeting of this committee the feasibility of a dental department was discussed, and it was considered advisable to make the attempt. Dr. J. W. Smith was then appointed a committee of one to invite other dentists to cooperate with him in forming the dental faculty. Dr. J. E. Orrison was selected as one of these and was invited to the next meeting, at which, in turn, he and Dr. J. W. Smith were made a committee to obtain sufficient teachers to complete the dental faculty.

On the third of June, 1895, the dental department of the Baltimore Medical College was incorporated under the general incorporation act of Maryland by Drs. S. K. Merrick, Wilmer Brinton, T. A. Ashby, J. E. Orrison and J. W. Smith.

At the third meeting the following members of the dental faculty were selected and officers elected as follows: Dr. T. A. Ashby, President; Dr. J. W. Smith, Dean, and Dr. J. E. Orrison, Secretary and Treasurer.

The Friends' school house, located at 715 North Eutaw Street, was rented and, about August 1st, of the same year, a dental infirmary was opened with a complete equipment of S. S. White's Wilkerson chairs, lathes, vulcanizers, and all necessary appliances for the instruction of students in operative and prosthetic dentistry, but without any students to instruct. Nevertheless, by the last of September the students began to come in, and by the 10th of October there were thirty-four matriculates. Of this number several were students in the senior and junior classes from other colleges. Those in the advanced classes began operating at once, and by the last of October there was a large clinic well under way. The effort of the faculty was to bring in patients from the various charitable institutions, which afforded a large clinic from the beginning.

The first matriculate, enrolled as a freshman, was from Louisiana, and others were from the following States: Maryland, Virginia, West Virginia, Ohio, Maine, Connecticut, Vermont, New York, North Carolina, Rhode Island,



J.W. SMITH, D.D.S.
Dean.



DENTAL DEPARTMENT
of the
BALTIMORE MEDICAL COLLEGE
Baltimore, Md.

Canada, Pennsylvania, Massachusetts, together with a post-graduate student from Nebraska.

In the fall of 1896 the dental department moved into its new building erected on North Howard street, near Madison street, having previously held all lectures in the halls of the Baltimore Medical College and the clinics in the Friends' school house, corner of Monument and Eutaw Streets.

The department has kept pace with the times in reference to improved methods to facilitate the work of the student. The infirmary is equipped with the latest improved chairs, fountain cuspidors, sterilizers, and everything to make a complete infirmary outfit. Our bacteriological, histological and pathological laboratories are equipped with over 100 microscopes for individual use among the students. The chemical laboratory is one of the largest in the country and is equipped with all the latest appliances. The dental laboratory has the latest improved electric lathes and compressed air. The anatomical laboratory contains sufficient tables to allow 100 students to dissect at the same time. It is perfectly lighted with windows and skylights, is thoroughly ventilated, and has hot and cold water, and other conveniences for practical anatomical work. Its floor is impervious to fluids and arranged for flushing and perfect drainage, conditions necessary for good sanitation.

The college has made a steady growth since its beginning and at the present time has graduates in almost every state in the Union, and from several foreign countries.

The present year we have the largest number of matriculates in the history of the college.

The present (1908) officers of the department are: Samuel K. Merrick, M. D., President; J. W. Smith, D. D. S., Dean; E. E. Cruzen, D. D. S., Secretary; J. M. H. Rowland, M. D., Treasurer.

FACULTY.

J. W. SMITH, D. D. S., Dean; Professor of Prosthetic Dentistry, Crown and Bridge Work.

J. E. ORRISON, D. D. S., Professor of Operative Dentistry and Dental Science.

A. C. POLE, M. D., Professor of Anatomy.

J. D. BLAKE, M. D., Professor of Operative and Clinical Surgery.

ROBERT W. JOHNSON, A. B., M. D., Professor of Principles and Practices of Surgery and Oral Surgery.

SAMUEL T. EARLE, M. D., Professor of Physiology.

J. FRANK CROUCH, M. D., Professor of Materia Medica and Therapeutics.

LECTURERS.

S. C. PENNINGTON, D. D. S., Nitrous Oxide Gas.

TILGHMAN B. MARDEN, A. B., M. D., Histology.

W. B. D. PENNIMAN, Chemistry.

DELANO AMES, M. D., Pathology.

CLINICAL INSTRUCTORS.

C. E. DUCK, D. D. S.

A. P. GORE, D. D. S.

J. EMORY SCOTT, D. D. S.

A. PRICE, D. D. S.

WILLIAM A. MILLS, D. D. S.

GEORGE R. CARTER, D. D. S.

B. MYER, D. D. S.

H. E. LUPUS, D. D. S.

DEMONSTRATORS.

H. PHILLIPS, D. D. S., Demonstrator in Charge.

WALTER LOWE, D. D. S., Assistant in Mechanical Dentistry.

B. BAR, D. D. S., Assistant in Operative Dentistry.

GEORGE E. STARR, D. D. S., Assistant in Crown and Bridge Work.

R. B. WARFIELD, M. D., Anatomy.

WALTON BOLGIANO, A. B., M. D., Anatomy.

JAMES B. BENNETT, M. D., Assistant in Anatomy.

A. LEE BROWNE, A. B., Chemistry.

DELANO AMES, M. D., Pathology.

The dental department of the Baltimore Medical College is a member of the National Association of Dental Faculties and is recognized as coming up to the requirements of National Association of Dental Examiners.

ST. LOUIS DENTAL COLLEGE.

FORMERLY MARION-SIMS COLLEGE OF DENTISTRY.

ST. LOUIS, MISSOURI.

BY J. P. HARPER, D. D. S.

The Dental Department of the Marion-Sims College of Medicine was founded in 1894, and occupied one small room in the medical building, with very meager equipment and seven students. Too much credit cannot be given the original faculty and officers, who had the courage and determination to struggle against many trying experiences, but they felt that the future promised sufficient to warrant their continued efforts.

The original faculty was composed of the following:

YOUNG H. BOND, M. D., President.

L. A. YOUNG, M. D., D. S., Dean, Professor of Operative Dentistry.

J. H. KENNERLY, D. D. S., Professor of Mechanical Dentistry and Metallurgy.

C. C. COWDERY, D. M. D., Professor of Dental Materia Medica and Therapeutics.

A. S. HALSTEAD, M. D., D. D. S., Ph. G., Professor Dental Anatomy (Human and Comparative).

P. F. HELLMUTH, A. M., M. D., D. D. S., Professor Oral Surgery, Dental Pathology and Orthodontia.

JACOB GEIGER, M. D., Professor Principles and Practice of Clinical Surgery.

HUGO SUMMA, A. M., M. D., Professor General Pathology and Pathological Anatomy.

O. E. TRUETLER, Ph. G., M. D., Professor Chemistry, Toxicology and Materia Medica, Director of Chemical Laboratories.

A. H. MEISENBACH, M. D., Professor Special and Clinical Surgery and Surgical Pathology.



HANAU W. LOEB, A. M., M. D., Sec. Professor of Physiology.

A. C. BERNAYS, A. M., M. D., R. C. S. E., Professor of Anatomy.

GIVEN CAMPBELL, M. D., Professor of Bacteriology.

W. C. JONES, A. M., Professor of Medical and Dental Jurisprudence.

LOUIS CRUSIUS, M. D., Professor of Histology.

H. W. BOND, M. D., Professor of Osteology.

Before the opening session of 1896-1897, the College was elected to membership in the National Association of Dental Faculties, and a small building was purchased for the exclusive use of this department. On account of the rapidly increasing classes, it became necessary during the following year to enlarge this building, and, in 1899, additional ground was purchased and the

old structure was replaced and the present splendid three-story building erected, with unobstructed light on all four sides and with the operating room occupying the entire second floor. This building was again refurnished in 1906 with the latest modern equipment.

In 1900 the Marion-Sims College of Medicine became the Medical Department of the St. Louis University, and the Dental College continued as an independent institution under the name of the Marion-Sims Dental College. In 1905 the name was changed to the St. Louis Dental College, under which name it continued until April, 1908, when it became the Dental Department of the St. Louis University, assuring its permanent place among the leading dental institutions of this country.

The tremendous development of the medical school along modern university lines, since it became an integral part of the St. Louis University, warrants the opinion that the University will be as generous, progressive and earnest in the development of its dental school.

The present faculty, 1909, consists of the following:

J. P. FRIEDEN, S. J., President.

J. C. BURKE, S. J., Regent.

CLARENCE DEWITT LUKENS, D. D. S., Dean, Professor of Orthodontia.

FRANK F. FLETCHER, D. D. S., Professor of Operative Dentistry.

JAMES P. HARPER, D. D. S., Professor of Dental Pathology and Superintendent.

WILLIAM F. LAWRENZ, D. D. S., Professor of Prosthetic Dentistry and Metallurgy.

HERMAN H. BORN, M. D., D. D. S., Professor of Dental Materia Medica and Therapeutics, and Dental Anatomy.

DANIEL SHOEMAKER, B. S., M. D., Professor of Anatomy.

ELMO P. PORTERFIELD, Ph. G., M. D., Professor of Histology.

EDMUND BONNOT, B. S., A. M., M. D., Professor of Chemistry and Bacteriology.

VIRGIL LOEB, A. B., M. D., D. D. S., Professor of Oral Surgery.

J. W. MARCHILDON, M. D., Professor of Pathology and Bacteriology.

CARROL SMITH, A. B., M. D., Assistant Professor of Surgery.

G. B. WINTER, D. D. S., Lecturer and Clinical Instructor on Nitrous Oxide Anesthesia.

OSCAR HAMMER, D. D. S., Lecturer on Dental Ethics and Clinical Dentistry.

J. K. CONROY, D. D. S., Special Lecturer on Operative Dentistry.

E. B. OWEN, D. D. S., Demonstrator of Prosthetic Dentistry.

S. T. McMILLIN, D. D. S., Demonstrator of Dental Anatomy.

FRANK RODGERS, D. D. S., Demonstrator of Operative Technics.

THE PITTSBURGH DENTAL COLLEGE, DENTAL DEPARTMENT OF THE WESTERN UNIVERSITY OF PENNSYLVANIA.

PITTSBURGH, PA.

By H. E. FRIESELL, D. D. S.

The Pittsburgh Dental College came into existence April 20, 1896, when its charter was granted to Drs. J. G. Templeton, H. W. Arthur, G. L. Simpson, W. H. Fundenberg, J. H. Beal, and S. L. McCurdy, who constituted the first board of trustees.

At this time Allegheny county had a population of 700,000 and within a radius of sixty miles there were two millions of people. The city of Pittsburgh contained schools representing all other professions, but young men desiring to enter upon the study of dentistry had been compelled to go to Philadelphia or Baltimore.

The demand for such an institution was quickly demonstrated by the phenomenal success it enjoyed from the very start. Probably no dental college has ever been organized in America with so large a number of students the first year, there having been 118 matriculations.

The college made application for membership in the National Association of Dental Faculties, was accepted at the earliest opportunity, and has retained that membership ever since.

From its beginning, the Pittsburgh Dental College was affiliated with the Western University of Pennsylvania, as its dental department. It was controlled by the original charter members until June, 1904, when the control was transferred to Drs. C. R. Jones, J. S. Ashbrook, S. L. McCurdy and H. E. Friesell. In October, 1905, the department was transferred absolutely to the Western University of Pennsylvania.

The college was located for six years at 711 Penn avenue, when it was compelled, by its rapid growth, to move to Tenth and Penn avenues, and three years later to its present home at the corner of Pride and Bluff Streets. Even this last home, which seemed sufficiently commodious, is being rapidly outgrown, and the near future will see the erection of a magnificent new building in the Schenley Park district, near the world famous Carnegie Institute and Polytechnic schools.

Each year has seen improvements in equipment and teaching methods, and many additions to the faculty, and though only twelve years old, the Pitts-



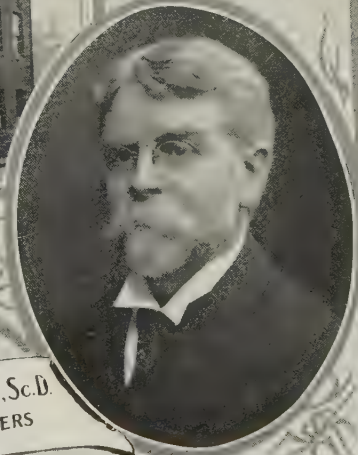
JAMES G. TEMPLETON M.D., D.D.S.
ONE OF THE FOUNDERS



H.
EDMUND
FRIESELL
D.D.S.
DEAN



PITTSBURG DENTAL COLLEGE
DENTAL DEPT.
UNIVERSITY of PITTSBURG



H.W. ARTHUR, D.D.S., Sc.D.
ONE OF THE FOUNDERS

burgh Dental College has graduated over 400 students, who have taken honors on numerous occasions before the state and army examining boards.

From 1896 to 1900, J. G. Templeton, A. M., M. D., D. D. S., served as dean; George L. Simpson, D. D. S., from 1900-1902; W. H. Fundenberg, D. D. S. from 1902-4, from which date the present dean, Dr. H. E. Friesell, has served.

In the spring of 1908 the Western University of Pennsylvania purchased forty-three acres of ground in the Oakland district of Pittsburgh, thereby securing a site for a university that is not excelled by any sister institution. On June 8th ground was broken for the first group of buildings, and others will follow in rapid succession, so that the permanent home of the dental department will soon be erected.

Application has been made to the courts to change the name of the University to the University of Pittsburgh.

The faculty of the college for 1908 is composed of:

SAMUEL BLACK MCCORMICK, D. D., LL. D., Chancellor.

H. EDMUND FRIESELL, D. D. S., Dean; Professor of Operative Dentistry and Crown and Bridge Work.

OWEN LOVEJOY HERTIG, A. M., D. D. S., Professor of Dental Pathology and Therapeutics, and Operative Clinician.

HARRY STEWART HASLETT, D. D. S., Professor of Prosthetic Dentistry, Anaesthetics and Extracting.

JOHN STEWART ASHBROOK, D. D. S., Professor of Dental Anatomy, Dental Medicine, and Comparative Dental Anatomy.

STEWART LEROY MCCURDY, A. M., M. D., Professor of Anatomy, Oral and General Surgery.

CLEMENT RUSSELL JONES, M. D., Professor of General Pathology, *Materia Medica* and Therapeutics.

DAVID WILLARD FLINT, D. D. S., Professor of Orthodontia.

WILLIAM LINCOLN FICKES, D. D. S., Professor of Dental Ceramics, Dental History and Oral Hygiene.

FREDERICK A. RHODES, M. D., Professor of Physiology and Embryology.

ALBERT FLOYD JUDD, Pharm. D., Professor of Physics, Chemistry and Metallurgy.

FREDERICK CHARLES FRIESELL, D. D. S., Professor of Histology and Bacteriology.

RALPH LAUSON SMITH, Lecturer on Dental Jurisprudence.

RUSSELL HERBERT BOGGS, M. D., Lecturer on Electricity and Roentgen Rays.

DEMONSTRATORS AND ASSISTANTS.

ROBERT ZUGSMITH, D. D. S.; ABRAM CHRISTY BARCLAY, D. D. S.; FRANK HOWARD MAGILL, D. D. S.; J. HOWARD CRAWFORD, D. D. S.; FRANK SMITH POST, M. D.; FREDERICK JOHN BLUMENSCHNIEDER, Pharm. D.; ANDREW BENNETT WALLGREN, M. D.; JOHN FLOCKER BIDDLE, D. D. S.; JOHN GRAYSON FITZHUGH, D. D. S.; JOSEPH R. COTTOM, D.

D. S.; HARRY S. SMITH, D. D. S.; ANDREW M. MARTIN, D. D. S.; ORLO CLIFTON SCHLAG, D. D. S.; CECIL OLIVER BOOTH, D. D. S.; H. C. FELDSTEIN, M. D.; GEORGE W. POLLOCK, M. D.; LESLIE WADDILL, D. D. S.; THOMAS A. HOGAN, D. D. S.; JOSEPH A. BOARTS, D. D. S.

COLORADO COLLEGE OF DENTAL SURGERY

DENVER, COLO.

BY W. T. CHAMBERS, D. D. S.

The Denver School of Dentistry was organized in 1887, and during the seventeen years of its existence has steadily grown in favor with the dental profession and people of Colorado, and has won its place among the dental colleges of our country.

It has been a member of the National Association of Dental Faculties since 1891, and is also recognized by the National Association of Dental Examiners.

Its first dean was A. B. Robbins, from 1888-89. He was re-elected in 1889-90. The second dean, 1890-91, was P. T. Smith. Thomas Gaddes was dean in 1891-2.

The following deans and secretaries were elected in the succeeding order:

1892-3—George J. Hartung.

1894-5—R. B. Weiser; A. H. Sawins, Secretary.

1896—J. M. Porter; W. E. Griswold, Secretary.

1897-1899—A. H. Sawins; A. C. Watson, Secretary.

1900-1901—L. S. Gilbert; A. L. Whitney, Secretary.

The real history of the Colorado College of Dental Surgery dates back to April, 1896, at which time the board of regents of the University of Colorado organized a department of dentistry with the following as a board of directors: W. T. Chambers, D. D. S.; M. S. Fraser, D. D. S.; J. S. Jackson, D. D. S.; H. A. Fynn, D. D. S.; A. L. Whitney, D. D. S.

The school opened November 2, 1896, with seven students.

The officers of the dental department were: J. H. Baker, LL. D., President; W. T. Chambers, D. D. S., Dean; M. S. Fraser, D. D. S., Secretary; A. L. Whitney, D. D. S., Superintendent of Infirmary.

In all there was a teaching faculty of nine professors and nine special lecturers, with a clinical staff of six dentists.

The infirmary was located at Eighteenth and Stout streets, in connection with the medical department of the state university.

Application was made for admission into the National Association of Dental Faculties, and a committee from that association examined the school during the winter session and reported favorably upon it.

In June, 1897, a decision of the supreme court, in a long pending suit, declared that it was impossible for the state university to conduct any of its departments outside of Boulder, the seat of the university.

Recognizing the impossibility of conducting a dental college in a small



city, and wishing to continue the work so well begun, the Colorado College of Dental Surgery Corporation was organized from the faculty of the dental department of the University of Colorado, and incorporated under the laws of the state of Colorado, in July, 1897.

The first officers of the Colorado College of Dental Surgery comprised the stock holders: H. A. Fynn, D. D. S., President; W. T. Chambers, D. D. S., Vice-President; A. L. Whitney, D. D. S., Secretary; J. S. Jackson, D. D. S., Treasurer; M. S. Fraser, D. D. S., Auditor.

The dental faculty consisted of twelve professors, eleven special lecturers, and a clinical staff of six.

The officers of the faculty were as follows: W. T. Chambers, D. D. S., Dean; M. S. Fraser, D. D. S., Secretary; J. S. Jackson, D. D. S., Treasurer.

The school opened on October 4, 1897, at Eighteenth and Larimer streets, with thirty matriculates.

Application was made for admission into the National Association of Dental Faculties under the new name of Colorado College of Dental Surgery, and during the session of 1897-8 a committee from that association visited the school and reported favorably upon it.

At the next meeting of the National Association of Dental Faculties, held in Omaha, in July, 1899, the school was admitted to membership. Early in the year 1900, the Colorado College of Dental Surgery secured suitable quarters at Champa and Eighteenth streets and moved to that location.

On March 29, 1901, a union was effected between the Denver School of Dentistry and the Colorado College of Dental Surgery, and an agreement entered into with the Colorado Seminary and the University of Denver whereby the Colorado College of Dental Surgery contracted to become the dental department of the University of Denver, and to conduct said department for a term of years.

The faculty of the united schools was composed of eighteen professors, eleven special lecturers and thirty-eight demonstrators and assistants.

The officers of the faculty were: H. A. Buchtel, D. D., LL. D., Chancellor; L. S. Gilbert, D. D. S., Dean; A. L. Whitney, D. D. S., Secretary; J. S. Jackson, D. D. S., Treasurer.

The college occupies desirable quarters, centrally located at Fourteenth and Arapahoe streets. The school year opened October 7, 1901. Ninety students matriculated with the school that year.

During the session of 1901-2, the resignation of L. S. Gilbert, dean of the school, was received and W. T. Chambers was elected to fill the vacancy, which position he has since retained.

The school is now thoroughly equipped with every modern convenience for imparting dental knowledge. Its prosthetic laboratories are furnished with electric lathes, electric furnaces, compressed air, and every necessary appliance. The anatomical laboratory is completely furnished with the most approved appliances. The histological, pathological and bacteriological laboratories are equipped with the Bausch & Lomb and Zulauf microscopes, incubators, sterilizers, etc. An up-to-date electric arc lantern with projecting microscopic attachment is used for viewing specimens direct from the laboratory. The chemical laboratory has every facility for the practical study of chemistry and metallurgy. The infirmary is equipped with S. S. White,

Columbia and Morrison chairs, fountain cuspidors and compressed air at each chair.

Gas is administered in the extracting room, and students are admitted to the various hospitals to view operations under ether and chloroform. Orthodontia practice also has an important part in the infirmary work.

Following are the matriculates by years: 1903-4, 58; 1904-5, 49; 1905-6, 58; 1906-7, 55.

Three years of graded study constitute the college course, covering a period of thirty weeks each year.

The first year instruction is given in anatomy, dental anatomy, physiology, chemistry, chemical laboratory, histology, materia medica, histological laboratory, operative and prosthetic technics, anatomical laboratory.

In the second year instruction is given in dental chemistry, metallurgy, bacteriology, general pathology, dental pathology, dental histology, prosthetic dentistry, materia medica, dental medicine, operative dentistry, anatomy, physiology, crown and bridge work, anatomical laboratory, infirmary, pathological laboratory and prosthetic laboratory.

The senior course of instruction consists of dental pathology, oral surgery, regional anatomy, dental medicine, orthodontia, crowns and bridges, including porcelain work, general anaesthesia, operative and prosthetic dentistry and electricity.

Three years of high school work, or preliminary examinations to that equivalent, are required for entrance, that the standard of qualifications may be maintained.

This college is thoroughly in line with the progressive spirit of the west, and employs the best instructors obtainable. The welfare and progress of its students are carefully considered.

The faculty for 1908 is composed of:

WILLIAM T. CHAMBERS, D. D. S., Professor of Operative Dentistry. Dean.

ARTHUR C. WATSON, M. D., Professor of Clinical Dentistry.

HIRAM A. FYNN, D. D. S., Professor of Regional Anatomy and Dental Histology.

AUVILLE L. WHITNEY, D. D. S., Professor of Dental Pathology.

J. STEWART JACKSON, D. D. S., Professor of Prosthetic Dentistry.

THOMAS E. CARMODY, D. D. S., D. D. Sc., M. D., Professor of Oral Surgery and Rhinology.

ALBERT H. KETCHUM, D. D. S., Professor of Orthodontia.

HERBERT W. MCLAUTHLIN, M. D., Professor of Materia Medica and Anæsthetics.

EDWARD F. DEAN, M. D., Professor of Anatomy.

A. W. STARBUCK, D. D. S., Professor of Porcelain Art, and Superintendent.

J. F. MORNING, M. D., Professor of Pathology, Histology and Instructor in Microscopical Laboratory.

TRACY R. LOVE, M. D., Professor of Physiology.

R. W. ARNDT, M. D., Professor of Bacteriology.

W. O. GARSIDE, D. D. S., Professor of Oral Prophylaxis and Examiner in Infirmary.

JOHN STEELE, D. D. S., Lecturer on Gold Inlays.

CLYDE V. SMEDLEY, D. D. S., Assistant in Prosthetic Dentistry.

B. A. SMALL, D. D. S., Professor of Operative and Prosthetic Technics.

W. HARMON HALL, D. D. S., Special Lecturer on Dental Ethics.

E. C. HILL, M. D., Special Lecturer on Chemistry.

CHARLES V. GANOE, M. D., Professor of Chemistry and Metallurgy.

MANFRED S. FRASER, D. D. S., Professor of Dental Therapeutics.

H. D. INGERSOLL, Lecturer on Dental Jurisprudence.

HOWELL T. PERSHING, M. Sc., M. D., Special Lecturer on Neuralgia and Syphilis of the Mouth.

RALPH W. PULLEN, D. D. S., Assistant Instructor in Orthodontia.

ALFRED C. GODFREY, M. D., Assistant Demonstrator of Anatomy.

DENTAL DEPARTMENT COLLEGE OF PHYSICIANS AND SURGEONS OF SAN FRANCISCO.

SAN FRANCISCO, CAL.

BY D. A. HODGHEAD, A. M., M. D.

The dental department of the College of Physicians and Surgeons of San Francisco had its origin at the time the college was incorporated, June 22, 1896. The dentist who was especially active in organizing and in building up the school is Thomas Morffew, D. D. S., of San Francisco. He has been on the board of trustees of the college since the college was organized and has been constantly industrious and very instrumental in making the school a success.

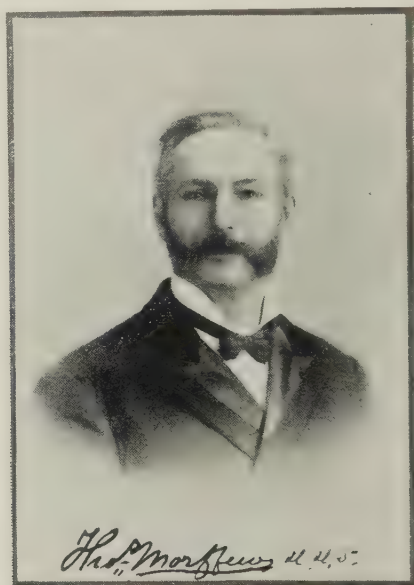
It is a matter of record, and one of which the school is justly proud, that the initial term of this school was attended by more students than ever attended the first session of any other dental school in America.

The school as soon as organized made application for membership in the National Association of Dental Faculties, and as soon as the necessary investigations could be made and the preliminary formalities gone through with, was elected to membership.

The college has always been conducted on a high plane of professional and ethical standards. Its faculty includes many of the best men in the profession on the Pacific coast. Its students have not only been abundant in

number, but also high in quality, and its graduates have readily taken a prominent stand among dental practitioners in different states where they have located. The school is coeducational.

Four years after organization land was purchased and a large building specially planned, was constructed. The school can be said to be now on a permanent and most excellent basis.



The faculty now, 1908, consists as follows:

- THOMAS MORFFEWE, D. D. S., Prof. of Operative and Prosthetic Dentistry.
- FRANCIS F. KNORP, M. D., Professor of Principles and Practice of Surgery.
- GEORGE CHILDS McDONALD, M. D., Brux, (Hon.); F. R. C. S. Edinburgh, M. R. C. S. England, Professor of Clinical Surgery.
- E. S. HOWARD, M. D., Professor of Anatomy.
- ETHAN H. SMITH, M. D., Professor of Orthopedics.
- J. F. DILLON, A. M., M. D., Professor of Materia Medica, Pharmacology and Therapeutics.
- CHAS. E. JONES, A. B., M. D., Professor of Chemistry.
- WALTER F. LEWIS, D. D. S., Emeritus Professor of Orthodontia.
- CARROLL O. SOUTHARD, M. D., Professor of Chemistry and Metallurgy.
- J. H. FLINT, Ph. G., Professor of Pharmaceutical Chemistry and Toxicology.
- EMIL WESCHCKE, M. D., Ph. G., Professor of Materia Medica and Therapeutics.
- O. E. EKLUND, M. D., Professor of Bacteriology.

- ARTHUR H. WHITE, M. D., Professor of Physiology.
 J. C. EGEBERG, M. D., Professor of Pathology.
 H. A. MAKINSON, M. D., Professor of Hygiene.
 J. P. JAEGLING, D. D. S., Clinical Professor of Crown and Bridge Work.
 O. B. BURNS, D. D. S., Professor of Orthodontia.
 A. E. SYKES, D. D. S., Professor of Dental Porcelain Art.
 GEORGE OLIVER RALER, D. D. S., Professor of Dental Hygiene.
 F. C. KECK, M. D., Ph. G., Professor of Electro-Therapeutics.
 ROBERT E. O'CONNELL, D. D. S., Adjunct Professor of Operative Dentistry and Operative Technique.
 ASA W. COLLINS, M. D., Adjunct Professor of Surgery and Lecturer on Oral Surgery and Surgical Technique.
 ARTHUR B. NELSON, M. D., Lecturer on Anatomy.
 BERTRAM STONE, M. D., Lecturer on Physical Diagnosis.
 E. M. CHERRY, Ph. G., M. D., Lecturer on Materia Medica and Therapeutics.
 CHAS. M. TROPMANN, M. D., Ph. G., Lecturer on Materia Medica, Pharmacology and Prescription Writing.
 CHARLES W. DECKER, D. D. S., Lecturer on Anesthesia and Extracting.
 JOHN F. RICHARDS, M. D., Lecturer on Histology, Biology and Embryology.
 RAYMOND R. CASTLE, D. D. S., Lecturer on Dental Histology and Embryology.
 F. D. TAFT, D. D. S., Lecturer on Prosthetic Dentistry.
 DR. J. S. KNOWLTON, Demonstrator of Prosthetic Dentistry and Continuous Gum Work.
 A. W. TAYLOR, D. D. S., Instructor in Operative Instrument Technique.
 AUGUST CAFFERATA, D. D. S., Demonstrator of Dental Operative Technique.
 M. J. SULLIVAN, D. D. S., Demonstrator of Operative Technique.
 U. GRANT BARTLETT, D. D. S., Demonstrator of Anesthesia and Extracting.
 J. H. MCKAY, D. D. S., Demonstrator of Dental Porcelain Art.

CENTRAL COLLEGE OF DENTISTRY.

INDIANAPOLIS, IND.

BY J. E. CRAVENS,

This college was organized at Indianapolis, Ind., in June, 1897, and was thoroughly equipped for the accommodation of 30 to 40 students. J. E. Cravens was the president, and M. S. Ault, Dean, E. E. Reese, treasurer, at the beginning of this institution. It was attempted to conduct this school without payment of salaries to most of the members of the faculty. As time wore on the medical members, especially, began to lose interest in the work, and the auspicious success at the start of this organization began to wane.

The college passed the standard required for admission to the National Association of Dental Faculties at the meeting of this Association at Old Point

Comfort, Virginia, and it was admitted to that organization shortly after. The matriculations which had reached one-half hundred, had now dwindled to fifteen or eighteen students. The trustees made a change in the deanship, which was immediately followed by an enrollment of about forty students. At the close of the fifth year, Dr. Cravens resigned the deanship, and withdrew from all connection with the college, after which another attempt was made to continue its operations, but the attendance continued to decline, and a year or two later the Central College of Dentistry collapsed entirely; it is believed as a result of injudicious management, and the losing of interest on the part of the members of the faculty. The diplomas of this school issued while it was in operation are recognized by state boards.

DEPARTMENT OF DENTISTRY OF THE MEDICO-CHIRURGICAL COLLEGE OF PHILADELPHIA.

PHILADELPHIA, PA.

BY I. N. BROOMEËLL, D. D. S.

This college had its origin in an association of physicians organized in 1848, and received its first charter of incorporation from the state legislature of Philadelphia in 1850.

In 1867, this charter was so amended as to constitute this association a regular medical college with the privilege of granting degrees in different specialties of medical and surgical science. Its first course of medical lectures was begun in 1881, but its growth and development were comparatively slow. It began life as a medical school at the southwest corner of Market and Broad streets. In 1888, an arrangement was effected by the medical school and the Philadelphia Dental College under which new buildings for occupancy by both were erected on Cherry street near Eighteenth. Under this arrangement, however, each organization retained its identity as a distinctive educational institution, occupying, however, certain portions of the same building separately and using some jointly. This arrangement was continued for a number of years and proved very satisfactory to both institutions.

Time developed, however, the necessity for the Medico-Chirurgical College's enlargement of space, and it, therefore, purchased the property interests of the Philadelphia Dental College, and that institution purchased a site and erected buildings for its own use at Buttonwood and Eighteenth streets. After a



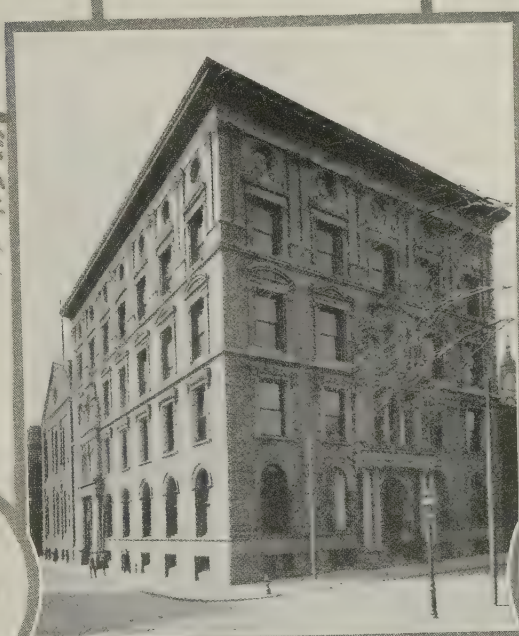
I.N. Broomell D.D.S.
Dean



CLINIC ROOM



R.W. Starr, D.D.S.,
Prof of
Orthodontia.



DENTAL DEPARTMENT
MEDICO - CHIRURGICAL COLLEGE
of PHILADELPHIA.



L. Ashley Faught, D.D.S.,
Prof. of
Operative Dentistry



Morris I. Chambers, D.D.S., M.D.,
Prof. of
Oral Surgery

time the Medico-Chirurgical College concluded to make use of the power given it in its charter "to grant degrees in special branches of medicine and surgery" and decided to establish a department of dentistry.

The Philadelphia Dental College demurred to this arrangement, but after a legal contest which was carried to the court of ultimate jurisdiction of the state, the medical college had its right to establish a dental department confirmed under its charter. This department opened its first course of lectures in the building on Cherry street near Seventeenth, which had formerly been occupied by the Philadelphia Dental College, in the autumn of 1897 and closed its first session on May 21, 1898. In June of that year, Professor Starr, who had been its first dean, resigned this position and also that of professor, as did Professor Jefferies. Drs. Walter H. Neall and James D. Price succeeded them.

The second annual commencement took place on May 20, 1899, on which occasion twenty-one degrees were conferred upon as many graduates.

The third annual session began October 2, 1899. Dr. George W. Cupit, during this session filled the vacancy created by the resignation of Professor Price. Twenty-two graduated in this class.

There was no change in the faculty for the session of 1900-1, which closed with the conferring of the degrees upon twenty-five successful graduates.

Thirty-two graduates received the degree in 1902.

For the year 1902-3, Professor Neall having resigned, Professor Cupit was transferred to his chair of operative dentistry and Earle C. Price filled the place previously held by Dr. Cupit. The degree was conferred upon twenty-five graduates on May 23, 1903.

On May 28, 1904, twenty-one successful graduates received their diplomas.

In common with dental colleges all over the country, the class of 1903-4 was smaller in its enrollment by reason of the suggested installation of a four years' course, and partly by reason of the disturbed industrial conditions of the country.

This school being the youngest of the Pennsylvania dental colleges, it naturally had smaller classes than the older schools. From its beginning to the present day the teachers of this school have done their work well, as attested by the record of their graduates before the examining board, notwithstanding the fact that most of them were inexperienced when they began and possessed of only local reputations.

The following is a list of the faculty as it was organized at the beginning of this school:

A. WALTER STARR, D. D. S.; ROBERT H. NONES, D. D. S.; CHARLES R. JEFFERIES, D. D. S.; J. V. SHOEMAKER, M. D.; ISAAC OTT, M. D.; JOHN C. HEISHLER, M. D.; JOSEPH MCFARLAND, M. D.; GEORGE H. MEEKER, PH. G.

The faculty is now (1908) composed as follows:

I. NORMAN BROOMELL, D. D. S., Professor of Prosthetic Dentistry, Dental Anatomy and Dental Histology.

R. WALTER STARR, D. D. S., Professor of Clinical Dentistry, Crown and Bridge Work and Orthodontia.

L. ASHLEY FAUGHT, D. D. S., Professor of Operative Dentistry, Dental Pathology and Therapeutics.

JOHN V. SHOEMAKER, M. D., LL. D., Professor of Anaesthesia and Materia Medica.

ISAAC OTT, A. M., M. D., Professor of Physiology.

JOSEPH MCFARLAND, M. D., Professor of Pathology and Bacteriology.

JOHN C. HEISLER, M. D., Professor of Anatomy.

GEORGE H. MEEKER, M. S., D. D. S., PH. D., LL. D., Professor of Physics, Chemistry and Metallurgy.

MORRIS I. SCHAMBERG, D. D. S., M. D., Professor of Oral Surgery.

I. N. BROOMELL, D. D. S., Dean.

KEOKUK DENTAL COLLEGE.

KEOKUK, IA.

BY B. C. HINCKLEY, D. D. S.

The Keokuk Dental College was organized as a department of the Keokuk Medical College in 1897, and conducted its first year of college teaching in 1897-98.

Recognition was given to the school by the National Association of Dental Examiners in 1900, and it was admitted to membership by the National Association of Dental Faculties the following year, 1901. The faculty was organized with a membership of ten regular instructors; eight special teachers were also engaged, making a total of eighteen members of the teaching staff.

The first bulletin was made up of the following instructors:

B. C. HINCKLEY, D. D. S., Dean; Professor of Operative Dentistry and Theory and Practice.

EDWARD G. SNODGRASS, D. D. S., Secretary; Professor Clinical Dentistry, Operative Technics and Crown and Bridge Work.

JOHN W. STARK, D. D. S., Treasurer; Professor of Prosthetic Dentistry, Prosthetic Technics and Metallurgy.

T. J. MAXWELL, M. D., Professor of General and Oral Surgery.

S. W. MOORHEAD, M. D., Professor of Materia Medica and Therapeutics.

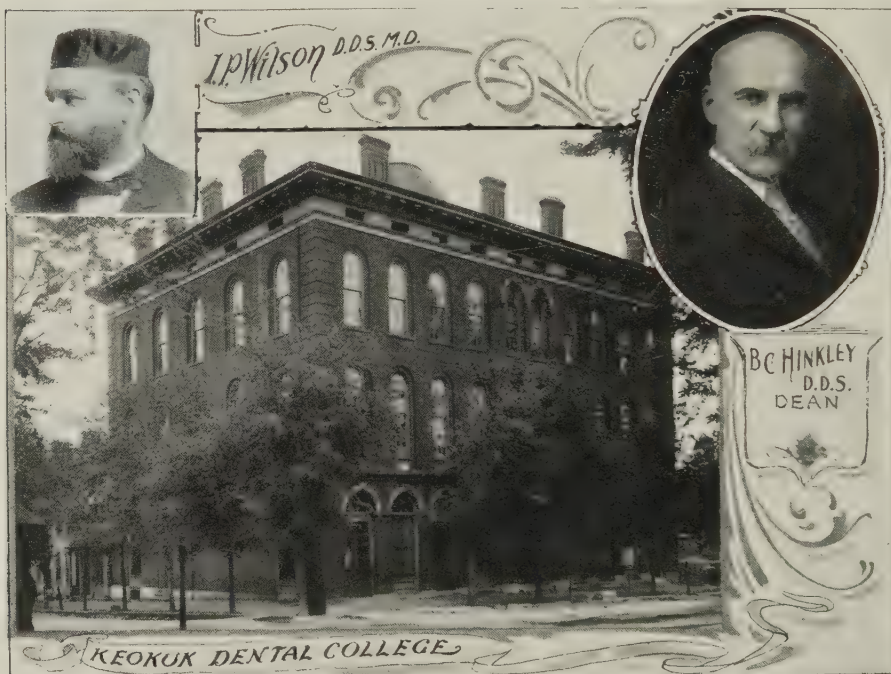
C. E. RUTH, M. D., Professor of Regional and Dental Anatomy.

WILLIAM C. HOWELL, A. M., Professor of Dental Jurisprudence.

OLIVER D. WALKER, B. S., M. D., Professor of Physiology and Histology.

F. M. FULLER, A. M., M. D., Professor of Chemistry and Director of Chemical Laboratory.

W. B. LAFORCE, B. S., M. D., Professor of Pathology, Bacteriology and Director of same Laboratories.



I. P. WILSON, D. D. S., Lecturer on Dental Histology, Pathology and Therapeutics.

H. L. MADISON, D. D. S., Lecturer on Orthodontia and Oral Deformities.

H. L. WHIPPLE, D. D. S., Lecturer on Operative Dentistry and Demonstrator of Porcelain Work.

E. P. HAZEN, D. D. S., Lecturer on Prosthetic Technics and Metallurgy.

J. W. HUBBARD, D. D. S., M. D., Lecturer on Syphilis and its Effect on the Teeth.

E. M. DONAHUE, D. D. S., Demonstrator of Operative Dentistry.

J. A. SCROGGS, M. D., Lecturer on Embryology.

R. M. LAPSLEY, M. D., Lecturer on the Relation of the Eye and Ear to the Teeth.

Among the dentists who have become active members of the faculty as instructors and special teachers since its organization are the following: I. P.

Wilson, D. D. S., M. D., who joined the faculty in 1899, taking the subjects of oral surgery, pathology and histology regularly. Dr. Wilson taught these branches of study until 1905, when he resigned on account of ill health and died a year later, at his home at Burlington, Ia.

Dr. Wilson was one of the most prominent educators for more than thirty years in the State of Iowa. Lloyd S. Lourie, D. D. S., came into the faculty the same year, 1899, as instructor of orthodontia. Dr. Lourie graduated at the Keokuk Dental College and later at the Angle School of Orthodontia, St. Louis, Mo. Dr. Lourie taught the subject of orthodontia at St. Louis (Angle School) and at Keokuk for several years. Resigning in 1903, he located in Chicago as a specialist to practice Orthodontia.

Dr. Snodgrass resigned his regular teaching and faculty connection in 1903 and was succeeded by H. P. Neeper, A. B., D. D. S. Dr. Snodgrass removed to Chicago to practice but still retains his connection as special lecturer or demonstrator at the college. Dr. Neeper resigned in 1906 to go to Bombay, India, to practice.

J. W. Marsh, D. M. D., succeeded Dr. Neeper, in 1906, as secretary of the faculty and professor of oral pathology and histology. Dr. J. W. Stark resigned in 1902, removing to Denver, Col., to practice. H. H. Stafford was elected to the chair made vacant by Dr. Stark, prosthetic dentistry and prothetic technics. Martin Dewey, D. D. S., succeeded Dr. Lourie to the chair of Orthodontia, but resigned in 1904 and located at Kansas City, Mo. J. E. Forney, D. D. S., succeeded Dr. Dewey to the chair of orthodontia and Dr. Neeper to the chair of crown and bridge work. A. W. Dana, D. D. S., Burlington, Iowa, was elected lecturer and demonstrator of porcelain inlays in 1903, at the time that this subject was introduced in the curriculum of the school.

Dr. W. E. Creath, M. S., D. D. S., of Ottumwa, Iowa; C. E. Slagle M. D., D. D. S.; Martin Long, M. D., D. D. S.; J. E. Forney, D. D. S., and A. B. Thompson, D. D. S., have filled the chair of dental medicine respectively from 1900 to the present time. F. B. Smales, D. D. S., was elected to the chairs of dental anatomy and operative technics in 1906.

Among the names of special instructors connected with the college at different times are T. A. Gormly, D. D. S., Mt. Vernon, Iowa; J. B. Monfort, D. D. S., Fairfield, Iowa; H. L. Whipple, D. D. S., Quincy, Ill.; Dr. H. R. Neeper, Hannibal, Mo.; H. W. McMillan, D. D. S., Roseville, Ill.; and Dr. J. E. Fleener, D. D. S., Oskaloosa, Ia.

The Keokuk Dental College merged with Drake University Dental Department, Nov. 1, 1908, and will be under the management of the university at Des Moines, Ia.

The present (1908) faculty consists of:

- B. C. HINCKLEY, D. D. S., Dean; Professor of Operative Dentistry.
 JOHN W. MARSH, D. M. D., Secretary; Professor of Oral Pathology and Histology.
 HERBERT H. STAFFORD, D. D. S., Professor of Prosthetic Dentistry and Prosthetic Technics.
 J. E. FORNEY, D. D. S., Professor of Orthodontia and Crown and Bridge Work.
 E. P. HAZEN, D. D. S., Professor of Metallurgy.
 FRED B. SMALES, D. D. S., Professor of Dental Anatomy and Operative Technics.
 A. B. THOMPSON, D. D. S., Professor of Dental Medicine.
 GEORGE W. JONES, M. D., Professor of Regional and Dental Anatomy.
 C. E. RUTH, M. D., Professor of General and Oral Surgery.
 A. B. HUGHES, M. D., Professor of Materia Medica and Therapeutics.
 WILLIAM C. HOWELL, A. M., Professor of Dental Jurisprudence.
 AMBROSE W. TEEL, M. D., Professor of Physiology.
 FRANK M. FULLER, A. M., M. D., Professor of Chemistry and Director of Chemical Laboratory.
 W. B. LAFORCE, B. S., M. D., Professor of Pathology and Director of Pathological Laboratory.
 C. R. ARMENTRAUT, M. D., Professor of Histology and Bacteriology and Director of these Laboratories, and Assistant to the Chair of Surgery.

LECTURERS AND DEMONSTRATORS.

AMOS W. DANA, D. D. S.; JOHN W. MARSH, D. M. D.; J. T. CROUCH, D. D. S.; ARTHUR B. THOMPSON, D. D. S.; HERBERT H. STAFFORD, D. D. S.; FRED B. SMALES, D. D. S.; T. A. GORMLY, D. D. S.; J. B. MONFORT, D. D. S.; H. W. McMILLAN, D. D. S.; J. E. FLEENER, D. D. S.; W. E. CREATH, M. S., D. D. S.; E. P. HAZEN, D. D. S.; ROBERT M. LAPSLEY, M. D.; J. A. SCROGGS, M. D.; B. C. HINCKLEY, D. D. S.; E. H. WOLLENWEBER, M. D.; WILLIAM H. HOGLE, M. D.

NEW ORLEANS COLLEGE OF DENTISTRY.

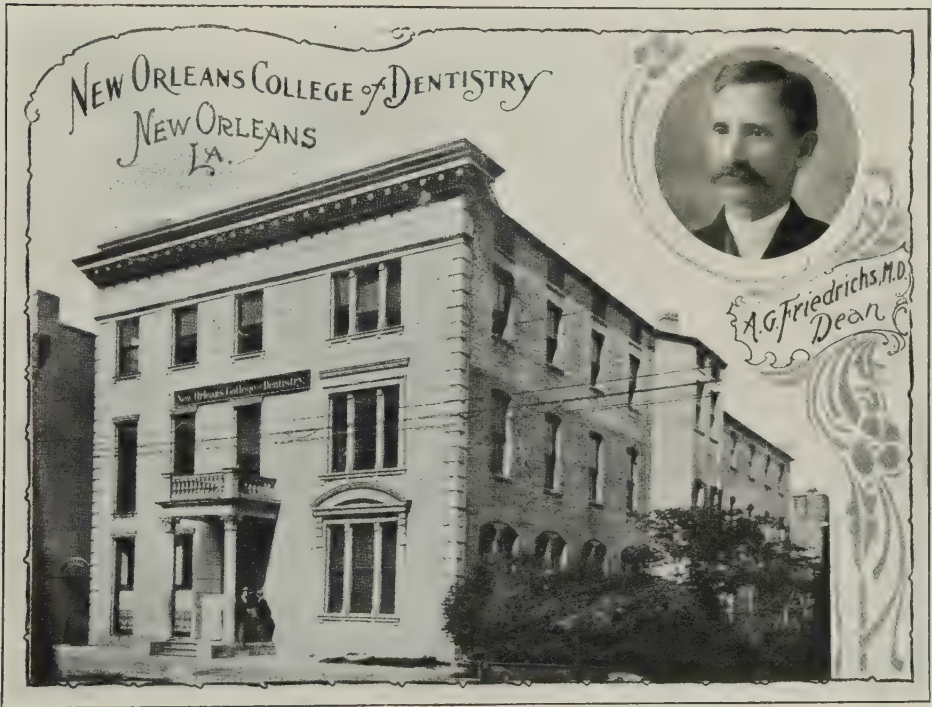
NEW ORLEANS, LA.

BY ANDREW G. FRIEDRICHS, M. D.

The New Orleans College of Dentistry was organized on May 27, 1899. On June 22, 1903, the present site, at 831 Carondelet street, New Orleans, was purchased. Since then a number of improvements have been added to the property until the building has assumed its present shape. It contains 20,000 square feet of floor space. The operatory is fifty feet square. There are three laboratories each forty by twenty feet, two lecture rooms of the same size, a chemical laboratory thirty by fifty feet, and library and reading room

for students forty by twenty feet, and a physiological laboratory twenty feet square. All rooms are equipped with the necessary teaching paraphernalia which goes to fit out a modern dental school.

The college is a member of the National Association of Dental Faculties and the rules governing colleges belonging to this association are strictly enforced. Attendance upon three full years of not less than thirty weeks each, in separate academic years, are required before examination for graduation.



The graduates of the school number 137.

The school has conferred the degree of D. D. S., upon more than 150 of its students.

Women are admitted to the college subject to the same rules governing men. The present (1908) faculty is composed of the following:

GEORGE J. FRIEDRICHS, M. D., D. D. S., Emeritus Professor of Operative Dentistry.

ANDREW G. FRIEDRICHS, M. D., D. D. S., Dean, Professor of Dental Surgery and Clinical Dentistry.

L. D. ARCHINARD, D. D. S., Secretary-Treasurer, Professor of Operative Dentistry and Dental Pathology and Therapeutics.

E. DENEGRE MARTIN, M. D., Professor of General and Oral Surgery.

JOHN J. ARCHINARD, A. M., M. D., Professor of Histology, Pathology and Bacteriology.

MARION H. MCGUIRE, M. D., Professor of Anatomy.

HOWARD P. MAGRUDER, D. D. S., Professor of Prosthetic Dentistry and Crown and Bridge Work.

E. D. FRIEDRICHS, A. M., M. D., Professor of Physiology and Hygiene.

PAUL DE VERGES, D. D. S., Professor of Dental Anatomy, Orthodontia and Materia Medica.

THEOBALD R. RUDOLF, M. D., CH. E., Professor of Chemistry and Metallurgy.

Dr. L. D. Archinard is the only member of the faculty who has been connected with the college since its organization.

NORTH PACIFIC DENTAL COLLEGE.

PORTLAND, OREGON.

BY HERBERT C. MILLER, M. D., D. D. S.

The North Pacific College of Dentistry of Portland, Oregon, was organized and received its charter from the state of Oregon, in 1898, under the name of the Oregon College of Dentistry. The organizers and members of its first faculty were: Herbert C. Miller, M. D., D. D. S., Dean; James R. Cardwell, John Welch, Everett M. Hurd, M. D., D. M. D.; Holt C. Wilson, M. D.; Ernest F. Tucker, A. B., M. D., E. G. Clark, D. D. S.; Otto S. Binswanger, M. D.; R. C. Yenney, M. D.; C. R. Templeton, D. D. S.; W. F. Amos, M. D.; E. L. Lane, D. D. S.

These men, who were the prime movers in founding the college, were assisted by a number of others.

In 1900 the Oregon College of Dentistry was consolidated with the Tacoma College of Dental Surgery, removed from Tacoma, Wash., and has since been known as the North Pacific College of Dentistry. From the time of the consolidation of the two schools the growth of the college has been apace with the splendid advancement and development of the North Pacific states. Although it occupied more than twenty-five thousand feet of space for its infirmary and clinic rooms, laboratories, class and lecture rooms, these accommodations were found insufficient to meet the growing demands and in May, 1907, a half block of land was purchased in Portland, close to the

heart of the city, in order that the college might erect new buildings specially suited to its needs.

Commencing as a local institution supplying the needs of the northwest, this college has grown and expanded until now its students are drawn not alone from the states west of the Rocky Mountains, but from many of the eastern states, from all the Canadian provinces, and in the Eastern Hemisphere



HERBERT C. MILLER, M. D., D. D. S.

from England, Germany, Austria, France, Switzerland, Norway, Sweden, Russia, Australia, Japan, China and other foreign countries.

The North Pacific College of Dentistry is a member of the National Association of Dental Faculties and complies with the rules of the National Association of Dental Examiners. During the session of 1906-7 there were 142 students in attendance. Each year shows an increased growth both in numbers and in the intellectual caliber of the student body.

The equipment of the college is new and modern and in accord with the advanced ideas of modern education, many of the appliances and fixtures being designed and made specially for this school.

The present (1908) faculty consists of the following:

HERBERT C. MILLER, M. D., D. D. S., Dean, Professor of Clinical Dentistry and Surgery.

ROBERT C. COFFEY, M. D., Professor of Principles of Surgery and Oral Surgery.

LOUIS J. FITZPATRICK, D. D. S., Secretary, Professor of Operative Dentistry and Technics.

EVERETT M. HURD, M. D., D. M. D., Professor of Prosthetic Dentistry and Histology.

ROBERT C. YENNEY, M. D., Professor of Physiology and Pathology.

JAMES F. BELL, M. D., L. R. C. P. (London), Professor of Materia Medica and Therapeutics.

OTTO S. BINSWANGER, PH. D., M. D., Professor of Chemistry and Toxicology.

JAMES R. CARDWELL, Professor of Jurisprudence, Ethics and Dental History.

JOSEPH A. PETTIT, M. D., Professor of Anatomy.

J. FRANCIS DRAKE, LL. B., D. M. D., Professor of Dental Chemistry and Metallurgy.

RALPH C. MATSON, M. D., Professor of Bacteriology.

GEORGE H. MARTIN, D. M. D., Professor of Prosthetic Technics.

ERNEST E. STARR, B. S. D., D. M. D., Professor of Dental Anatomy.

VIRGINIA SCHOOL OF DENTISTRY. MEDICAL COLLEGE OF VIRGINIA.

RICHMOND, VA.

BY FRANK W. STIFF, D. D. S.

The Medical College of Virginia was organized in 1838, under the name of the Medical Department of Hampden-Sydney College, and was the first medical school to stem the tide of students going by thousands to northern colleges.

The legislature of Virginia gave a charter to the institution on February 25, 1854, under the name of Medical College of Virginia. In 1861 the legislature gave the college \$30,000 with which to erect a hospital on condition that the college deed to the state the college building and appurtenances. The land on which the college building was erected had been deeded to the faculty by the city of Richmond, subject to a mortgage of \$15,000 loaned by the state to equip the school. This present from the city was worth at that time \$40,000.

The Virginia School of Dentistry was added to the Medical College of Virginia, by charter from the legislature, in 1898. The following faculty was elected by the board of visitors:

HENRY C. JONES, D. D. S., Professor of Operative, Prosthetic and Clinical Dentistry; Chairman of the Faculty.

THOMAS R. MARSHALL, M. D., D. D. S., Professor of Principles of Dentistry, Oral Surgery and Special Anatomy of the Head.

H. H. LEVY, M. D., Professor of Physiology and Hygiene.

WILLIAM H. TAYLOR, M. D., Professor of Chemistry and Metallurgy.

E. C. LEVY, M. D., Professor of Histology, Pathology and Bacteriology.

WILLIAM P. MATHEWS, M. D., Professor of Anatomy.

R. F. WILLIAMS, M. D., Professor of Materia Medica and Therapeutics.



COLLEGE BUILDING

Requirements of admission to the dental school were graduation from a college or high school, or from some other literary institution of approved standing; or else examination conducted under supervision of the faculty in accordance with the requirements of the National Association of Dental Faculties. A diploma from a reputable medical college entitled its holder to enter the intermediate class, which excused attendance on lectures on anatomy, chemistry, physiology, materia medica and therapeutics.

The Medical College of Virginia being a state institution, as many as five dental students from Virginia were entitled to matriculate free of all charges save matriculation and diploma fees. The fees for the entire session were \$90, which included the matriculation fee of \$5, but not the diploma fee of \$30.

The school graduated one student in 1898—Sidney Brooks Perry, of Lewisburg, N. C.

Dr. Edwin P. Wright was added to the faculty in 1898 as professor of prosthetic dentistry, dividing the chair of Dr. Jones. Richard C. Walden was added as instructor in crown and bridge work.

In 1899 J. Hall Moore, M. D., was elected professor of clinical dentistry and Richard C. Walden, D. D. S., acting professor of principles of dentistry, oral surgery and special anatomy of the head, as well as being instructor in crown and bridge work. Dr. Thomas R. Marshall retired from the faculty that year and Dr. Charles M. Hazen was added as professor of physiology. There were no graduates in 1899. The fees were reduced to \$65 for the entire session.

The following year, 1900, Dr. E. C. Levy retired from the chair of histology, pathology and bacteriology. Four students were graduated. As further requirements for matriculation it was required to have each applicant present two certificates, one to be signed by dentists or physicians recommending the applicant as to moral character, and the other to be signed by the superintendent of public instruction testifying to scholastic attainments equal to those required for a first grade teacher's certificate in the public schools.

In 1901 Dr. Ennion G. Williams was elected to occupy the chair formerly filled by Dr. E. C. Levy. There were four graduates that year.

In 1902 Dr. Frank W. Stiff was elected as acting professor to succeed Dr. E. P. Wright of the chair of prosthetic dentistry. Dr. J. Hall Moore was elected chairman of the faculty. Dr. William M. Stith was elected demonstrator of prosthetic dentistry and Dr. W. C. Adams demonstrator of clinical dentistry. The fees were raised to \$100. There were four graduates that year.

In 1903 Dr. Stephen F. Hart was elected to the chair of operative technique and orthodontia and Dr. F. W. Stiff to the chair of prosthetic dentistry. Dr. W. C. Adams, demonstrator of clinical dentistry, retired. The school applied for membership in the National Association of Dental Faculties. During the year preliminary examination for matriculation in the absence of a certificate of proficiency was put in the hands of Professor Frank P. Brent, secretary of the state board of education. Education equivalent to entrance in the third year of the high school was required. The graduates in 1903 numbered eleven.

In 1904 Dr. William M. Stith was elected to the chair of principles of dentistry, oral surgery and special anatomy of the head and also made instructor in crown and bridge work. Dr. Frank M. Reade was elected professor of materia medica and therapeutics. The school was admitted to membership in the National Association of Dental Faculties, and also registered with the Board of Regents of New York. Eight students were graduated.

Dr. Clifton M. Miller was elected to the chair of anatomy in 1905 to succeed Dr. Mathews, who resigned. Dr. J. R. Perkins was elected demonstrator of prosthetic dentistry and Dr. J. M. Lewis demonstrator of operative dentistry. The graduates that year numbered six.

In 1906, Dr. F. W. Stiff was elected chairman of the faculty, Dr. Moore resigning that position. Dr. J. M. Lewis was made acting professor of operative technique and orthodontia. Five students were graduated and the fees raised to \$150.

The following year Dr. J. M. Lewis was elected as full professor of his chair and Dr. Blackwell was elected to the chair of clinical dentistry. Eight students were graduated.

The present (1908) faculty consists of:

FRANK W. STIFF, D. D. S., Chairman of the Faculty, Professor of Prosthetic Dentistry.

HENRY C. JONES, D. D. S., Emeritus Professor of Operative Dentistry.

WILLIAM MEADE STITH, D. D. S., Professor of Operative Dentistry.

B. T. BLACKWELL, D. D. S., Professor of Orthodontia and Oral Hygiene.

B. V. MCCRAY, D. D. S., Professor of Oral Surgery and Dental Jurisprudence.

(TO BE APPOINTED.)

Professor of Clinical Dentistry, Crown and Bridge Work and Operative Technique.

(TO BE APPOINTED.)

Professor of Dental Pathology and Therapeutics.

WILLIAM H. TAYLOR, M. D., Professor of Chemistry and Metallurgy.

CHARLES M. HAZEN, M. D., Professor of Physiology.

FRANK M. READE, M. D., Professor of Materia Medica and Therapeutics.

J. FULMER BRIGHT, M. D., Professor of Anatomy.

GREER BAUGHMAN, M. D., Professor of Histology, Pathology and Bacteriology.

LINCOLN DENTAL COLLEGE.

LINCOLN, NEBR.

BY W. CLYDE DAVIS, M. D., D. D. S.

Lincoln Dental College, associated with the University of Nebraska, was organized June 29, 1899.

An attempt was first made to get an appropriation from the state to establish a dental department in the Nebraska State University, but it failed. It was then decided to establish an independent school upon funds gained by the organization of a stock company and ultimately associate it with the University of Nebraska, which association was realized April 24, 1903, by the creation of a joint contract, whereby the University of Nebraska assumed the responsibility of the instruction in all collateral branches and a censorship over the strictly dental subjects to be taught by and at the expense of the stock company, thus removing the necessity of securing an appropriation for added equipment.

From the time of its organization to its association with the University of Nebraska, the dental school was allied with the Lincoln Medical College and Cotner University. This was done to suit the convenience of the college in securing teachers and faculties in the medical branches, but its financial status has always been maintained as an independent corporation.



The first session opened September 17, 1899, and the first class graduated April 17, 1901. The following were the members of the first faculty:

W. CLYDE DAVIS, B. S., M. D., D. D. S., Dean and Professor of Dental Pathology, Oral Surgery and Hygiene.

CLIFFORD R. TEFFT, Secretary and Professor of Operative Technic.

*H. FINLEY HELMS, D. D. S., Professor of Dental Anatomy and Porcelain Art and Clinical Demonstrator.

H. A. SHANNON, D. D. S., Professor of Prosthetic Dentistry and Crown and Bridge Work.

*OLIVER JOHNSON, D. D. S., Professor of Prosthetic Technic and Orthodontia.

HARRY M. DUNN, D. D. S., Professor of Operative Dentistry.

J. R. SHANNON, D. D. S., Professor of Dental Materia Medica and Therapeutics.

*T. F. SKEEDE, Professor Dental Economics and Demonstrator of Prosthetic Technic.

H. H. JONES, B. A., Professor of General and Special Chemistry, Histology, Bacteriology and Metallurgy.

FRANK L. WILMETH, M. D., Professor of Materia Medica and Therapeutics.

E. ARTHUR CARR, M. D., Professor of Descriptive and Surgical Anatomy and Anaesthetics; also Demonstrator of Practical Anatomy.

JOSEPH MORROW, M. D., Professor of Osteology.

E. J. LATTA, M. D., Professor of Physiology.

*W. S. LATTA, M. D., Professor of General Pathology.

JULIUS M. MCLEOD, M. D., Professor of Principles and Practice of Surgery.

CARROLL S. RAINBOLT, Professor of Dental Jurisprudence.

M. B. KETCHUM, M. D., PHAR. D., Professor of Prescriptions and Pharmacy.

CLINICAL DEMONSTRATORS.

*H. FINLEY HELMS, D. D. S., Operative Dentistry and Prosthetic Technic.

CLIFFORD R. TEFFT, Operative Technic.

W. CLYDE DAVIS, M. D., D. D. S., Anæsthetics and Oral Surgery.

G. W. SCHWARTZ, M. D., D. D. S., Porcelain Art.

H. A. SHANNON, D. D. S., Crown and Bridge Work.

E. ARTHUR CARR, M. D., Practical Anatomy.

ELIZABETH C. FIELD, B. A., Microscopical Technic.

*OLIVER JOHNSON, D. D. S., Orthodontia.

* Now deceased.

Each year has brought its changes in the faculty so that at the present time (the opening of the ninth session) there only remain of the original faculty: Dr. Clyde Davis, its present dean, who has held this position since its organization, and Dr. Clifford R. Tefft.

The following are the members of the faculty at present, session of 1908:

WALLACE CLYDE DAVIS, B. S., M. D., D. D. S., Dean, Professor Operative Dentistry and Technic.

WILLIAM THOMAS HUMPHREY, D. D. S., Secretary, Professor Prosthetic Dentistry, Technic, and Dental Anatomy.

FRANK B. DAMRON, D. M. D., Assistant Professor Prosthetic Dentistry.

MILFRED ORBY FRASER, D. D. S., Professor Dental Materia Medica and Therapeutics.

JOSEPH BERNARD TROYER, D. M. D., Professor of Dental Pathology and Jurisprudence.

ALBERT PHEFFLER TAYLOR, D. D. S., Professor Oral Bacteriology and Dental Histology.

RALPH MARCELLUS MORRILL, M. D., Consulting Physician, Professor of Principles of Practice and General Pathology.

CHARLES HENDERSON RUSH, M. D., Consulting Surgeon, Professor of Principles of Surgery.

SAMUEL METHENY, M. D., Professor General Materia Medica and Therapeutics.

EDWIN GARY ANTRIM, D. D. S., Professor of Orthodontia.

EARL R. TRUELL, D. M. D., Professor of Oral Surgery and Anæsthetics.

ALBERT J. COBB, D. D. S., Instructor in Technic.

ALBERT GAISER, Instructor in Porcelain Art.

CLIFFORD R. TEFFT, Lecturer on Dental Hygiene and Ethics.

Members of the University Faculty from Whom the Students of the Dental College

Receive Instruction in Contract Subjects.

*SAMUEL AVERY, Ph. D., Professor of Chemistry.

*GEORGE BORROWMAN, D. Sc., A. M., Instructor in Chemistry.

*ROBERT HENRY WOLCOTT, A. M., M. D., Professor of Anatomy.

*WILLIAM ALBERT WILLARD, A. M., Assistant Professor of Zoology, Instructor in Histology.

*AUGUST EARNEST GUENTHER, Ph. D., Assistant Professor of Physiology.

*L. B. PILSBURY, M. D., Instructor in Bacteriology.

INFIRMARY STAFF.

MILFRED ORBY FRASER, D. D. S., Demonstrator in charge of Infirmary.

WILLIAM THOMAS HUMPHREY, D. D. S., Superintendent and Demonstrator of Prosthesis and Dental Anatomy.

WALLACE CLYDE DAVIS, B. S., M. D., D. D. S., Superintendent and Demonstrator of Operative Technic.

ALBERT J. COBB, D. D. S., Demonstrator in Technic.

LEWIS M. MILLER, D. D. S., Assistant Demonstrator.

JULIUS MARTIN MCLEOD, M. D., Demonstrator of General Surgery.

The school has always maintained high standards and conformed to the rules of the National Association of Dental Faculties, of which organization it became a member at its annual meeting in 1904.

As to its equipment and buildings, they are largely those of the University of Nebraska, as the major portion of the instruction is done in buildings and with the equipment of the university used in the other general classes, which, if separated from the university and set aside for dental education only, would represent an investment of probably \$500,000.

Only one portion of a single building is set aside for dental purposes only and this is not a part of the university, but is located on the business streets of the city to facilitate securing clinical material, which is more than ample.

COLLEGE OF DENTISTRY, UNIVERSITY OF SOUTHERN CALIFORNIA.

LOS ANGELES, CAL.

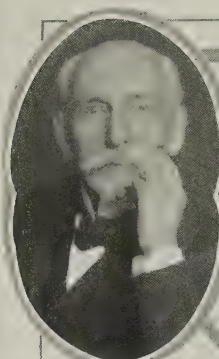
BY GARRETT NEWKIRK, M. D.—PASADENA.

The College of Dentistry of the University of Southern California had its initiation through the efforts of Dr. Henry G. Brainerd, dean of the medical college of the university, in the year 1897. Looking forward with prophetic vision, Dr. Brainerd saw that a dental school would be a necessary outcome of conditions present in Southern California. And he conceived the plan of starting such a school in connection with the medical college, having anatomy, physiology, chemistry and kindred branches taught to medical and dental students in common, with a separate place for special dental teaching, and an infirmary. This plan was inaugurated and continued for several years until the new institution had grown to proportions which seemed to justify its entire independence.

During the first year of its history Dr. Brainerd acted as dean of both the medical and dental schools. Several of the professors of the medical have continued as professors of the dental school up to the time of this writing, 1908. Since the initial period the following named have been the deans of the school. Dr. Edgar Palmer, 1898 to 1900; Dr. Garrett Newkirk, 1901 to 1905; Dr. Lewis E. Ford, 1905 to the present time. In the years 1899 to 1900, Dr. George H. Cushing was superintendent of the infirmary and demonstrator of operative dentistry. After his death the position was filled for several years by Dr. C. A. Kitchen, from Rockford, Illinois. In 1902, Dr. William Bebb came from Chicago to assume the duties of secretary and teacher of comparative anatomy. Since Dr. Kitchen's retirement he has acted also as superintendent of the infirmary. Under his direction, too, there has been developed a fine museum and library, known as the George H. Cushing library.

In 1904, the college having outgrown its quarters, the faculty decided to erect a building especially to fit its needs. In 1905, this was completed and the college moved into the new building. In the construction of the building every convenience for the teaching of dentistry has been provided.

At about the same time the college was disincorporated as a stock company and reincorporated as an educational institution without stock. The men who had been stockholders gave the equipment and several thousand dollars, then in the treasury, to the college as an endowment. The college is



EDGAR PALMER, D.D.S.
DEAN, 1898-1900.



CLINIC



GARRETT NEWKIRK, M.D.
DEAN 1901-1905



COLLEGE OF DENTISTRY
UNIVERSITY OF SOUTHERN CALIFORNIA
LOS ANGELES, CALIFORNIA



LEWIS E. FORD, D.D.S.
DEAN.

now one of the best equipped to be found anywhere. Its surplus income can be spent only for teaching and additional equipment.

When it was reorganized a board of trustees was provided for, one member to be elected by the University of Southern California, one by the Southern California Dental Association, one by the faculty of the college and one by its alumni, in order that the profession might have a direct voice in the management.

A favorite advertisement of the school is that it gives "A Winter course in June weather."

The faculty of the school for 1908 is as follows:

GEORGE F. BOVARD, A. M., D. D., President of the University.

LEWIS E. FORD, D. D. S., Dean, Professor of Operative Dentistry.

HENRY G. BRAINERD, A. B., M. D., Emeritus Professor of Medicine.

WILLIAM C. SMITH, D. D. S., Professor of Dental Pathology, Materia Medica, Therapeutics.

EDGAR M. PALLETTE, Ph. D., M. D., Special Lecturer on Nervous Physiology.

H. GALE ATWATER, D. D. S., Professor of Operative Technics.

WILLIAM BEBB, D. D. S., Secretary, Professor of Comparative and Dental Anatomy.

CHARLES D. LOCKWOOD, A. B., M. D., Professor of Oral Surgery and Anesthesia.

JOSEPH D. MOODY, D. D. S., Professor of Ethics and Hygiene.

RAY D. ROBINSON, D. D. S., Professor of Orthodontia.

E. L. LEONARD, B. S., M. D., Professor of General and Dental Histology, and General Pathology.

T. C. MYERS, M. D., Professor of General Materia Medica and Therapeutics.

JOHN L. KIRKPATRICK, M. D., Professor of Anatomy.

B. F. ESHELMAN, D. D. S., Professor of Prosthetic Dentistry, Porcelain and Infirmary Demonstrator.

C. H. BOWMAN, D. D. S., Professor of Crown and Bridge Work, Demonstrator Infirmary and Crown and Bridge Technics.

CLARENCE A. JENKS, B. S., M. D., Professor of Physiology.

M. EVANGELINE JORDON, D. D. S., Associate Professor of Operative and Clinical Dentistry (Children's Teeth).

J. WALTER GRAY, D. D. S., Assistant Professor of Operative Dentistry.

THOMAS A. LYNCH, D. D. S., Assistant to the Chair of Operative Technic.

EUGENE OVERTON, Lecturer on Dental Jurisprudence.

WISCONSIN COLLEGE OF PHYSICIANS AND SURGEONS.

MILWAUKEE, WIS.

BY P. B. WRIGHT, D. D. S.

The Wisconsin College of Physicians and Surgeons, located in Milwaukee, is the oldest institution of its kind in Wisconsin, having been established in 1893. The department of dental surgery was inaugurated in 1899 with a staff of twenty-nine instructors. Dr. Reinhold E. Maercklein was appointed executive officer and served for several months until Dr. Louis J. Stephan was appointed dean in 1900.

The course of instruction was made to extend over a period of three years, the length of each annual session being seven months.

The college building, having been built expressly for educational purposes, is all that could be asked for. In its planning every feature has received careful consideration. While every foot of floor space is in constant use, there is no crowding, and each branch of instruction is provided with ample room for its perfect demonstration. The building is seventy-six feet on Fourth street and sixty-six feet on Reservoir avenue, and is five stories high above the basement. It has a large amphitheater with a seating capacity of more than two hundred, besides two large and three small lecture rooms. The dental operatory, situated on the main floor, is a spacious and well-lighted room, having six large windows opening on the north and four on the west side. This room is supplied with operating chairs of the latest pattern, with fountain cuspidors attached. The stationery wash bowls are conveniently arranged for the use of the students. The office, trustees' and faculty's rooms, dean's room, drug room and reading room for the students take the balance of the first floor.

In the basement are the dental laboratories, which are well lighted and fitted with the necessary benches, electric lathes, lockers and other conveniences for the students' use. The well equipped gymnasium, with hot and cold water shower baths, is also a very desirable feature. The building is heated throughout with steam. The heating apparatus being outside of the building under the side walk, the danger from fire is materially lessened.

The college is co-educational, equal advantages being enjoyed by the men and women. A home-like rest room is furnished and set aside for the special use of women students. This is situated on the second floor, and has proven a very satisfactory adjunct.

The second, third and fourth floors of the building are devoted mainly to lecture rooms, demonstrators' rooms, and the laboratories of chemistry, physi-

ology, histology, pathology and bacteriology. These laboratories have been equipped by Professor Solon Marks, a man who has occupied an enviable place in the medical profession in Wisconsin for more than forty years. In these laboratories will be found apparatus to meet every requirement of the medical and dental student, and the equipment is being added to constantly.

The fifth floor is devoted entirely to anatomy, and is lighted by sky-lights and perfectly ventilated. Besides a dissecting room, which accommodates eighty students at one time, there are on this floor the anatomical lecture room, osteology room, demonstrators' room and toilet. The building is supplied throughout with improved sanitary arrangements and perfect cleanliness is required of all the students.

Since the organization of the college, the office of dean has been filled as follows: 1900-2, Dr. L. J. Stephan; 1902-4, Dr. J. T. Stuart; 1904-6, Dr. Charles L. Babcock; 1906-7, Dr. A. H. Traver. In June, 1907, Dr. P. B. Wright was appointed dean.

In 1906 the business management of the college was placed in the hands of a board of trustees consisting of about twenty members, thus relieving the stockholders and faculty members of the cares of business management, and making the college a purely educational institution.

Up to the present time, the college has conferred the degree of D. D. S. upon forty-three graduates. The officers, faculty members, and instructors at present (1908) number thirty-six, as follows:

FACULTY.

A. HAMILTON LEVINGS, M. D., President of Faculties; Professor of Oral Surgery and Clinical Surgery.

P. B. WRIGHT, D. D. S., Dean; Professor of Operative Dentistry and Superintendent of Infirmary.

RENO WEISS, D. D. S., Professor of Orthodontia.

L. J. STEPHAN, D. D. S., Professor of Dental Pathology and Therapeutics.

F. J. WILSON, D. D. S., Professor of Dental Anatomy and Operative Technics.

E. T. HANDY, D. D. S., Professor of Prosthetic Dentistry.

E. M. JONES, D. D. S., Professor of Metallurgy.

E. F. KING, D. D. S., Professor of Dental Materia Medica and Therapeutics.

WILLIAM H. CUDWORTH, Professor of Dental Ceramics.

CHARLES L. BABCOCK, D. D. S., Professor of Dental History and Ethics.

H. A. SIFTON, M. D., Professor of Anatomy.

L. F. RUSCHHAUPT, B. SC., M. D., Professor of Chemistry.

J. M. BEFFEL, M. S., M. D., Professor of General Pathology and Director of the Marks Laboratories.

F. E. DARLING, S. B., M. D., Professor of Bacteriology.

RAYMOND J. WENKER, D. D. S., Associate Professor of Orthodontia, Operative Technics, and Dental Anatomy.

LECTURERS, DEMONSTRATORS AND INSTRUCTORS.

ADOLPH GROPPER, Lecturer and Demonstrator of Crown and Bridge Work, Porcelain and Continuous Gum.

CHARLES L. BABCOCK, D. D. S., Lecturer on Orthodontia.

H. D. SYKES, PH. L., M. D., Lecturer on Pharmacology.

WILLIAM C. WENDEL, D. D. S., Lecturer on Operative Dentistry.

R. G. RICHTER, D. D. S., Lecturer on Oral Pathology.

E. A. GEILFUSS, D. D. S., Lecturer on Operative Dentistry and Infant Dentition.

J. C. CAMPBELL, Demonstrator and Instructor in Extraction of Teeth and Minor Oral Surgery and Administration of Nitrous Oxide Gas.

H. E. HOLBROOK, S. B., D. D. S., Lecturer on Comparative Dental Anatomy and Embryology.

NELSON M. BLACK, M. D., Nasal Deformities in Relation to Irregularities of the Teeth.

C. W. HALL, D. D. S., Lecturer on Oral Hygiene and Prophylaxis.

E. J. PATTERSON, Attorney at Law, Lecturer on Dental Jurisprudence.

F. C. GILLEN, M. D., Lecturer on Diagnosis.

C. A. EVANS, A. B., M. D., Associate in Anatomy.

ARTHUR REITMAN, S. B., M. D., Demonstrator of Anatomy.

F. J. PFEIFER, S. B., Lecturer on Physiology.

M. M. SPITZ, M. D., Lecturer on Anesthetics and Therapeutics.

G. C. RUHLAND, M. D., Lecturer on Histology.

T. E. CAVANAUGH, M. D., Lecturer on Embryology.

J. S. JANSSEN, Roentgenologist, Demonstrator of the X-Ray in Dentistry.

E. F. KING, D. D. S., Lecturer on Porcelain and Gold Inlay.

BOARD OF TRUSTEES.

August H. Vogel, President; Jacob E. Friend, Vice-President; Howard Greene, Secretary and Treasurer; Dr. A. H. Levings, Hon. James M. Pereles, Jeremiah Quin, Dr. G. A. Kletzsch, Hon. A. L. Kreutzer, Frederick W. Sivyer, William Woods Plankinton, Thomas C. Phillips, John W. Suetterle, Gustav Wollaeger, Dr. Henry B. Hitz and E. J. Lindsey.

GEORGETOWN UNIVERSITY DENTAL DEPARTMENT.

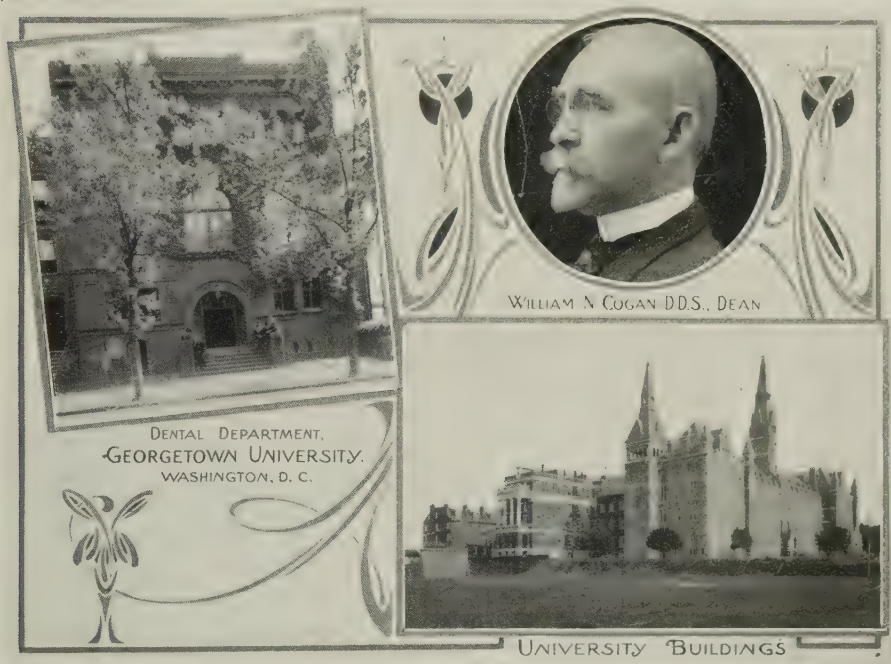
WASHINGTON, D. C.

BY W. N. COGAN, D. D. S.

The foundation of Georgetown College was projected as early as 1785, when the Rev. John Carroll, afterward the first archbishop of Baltimore, formed the plan and proposed it to his associates. November 13, 1786, the Corporation of Roman Catholic Clergymen, in the chapter held at Whitemarsh, Md., adopted a series of "resolves concerning the institution of a school," in which it was ordered that a school should be erected at Georgetown, Md., and

directed the sale of a piece of land belonging to the corporation in order that the proceeds might be applied to the erection of the first building. Rev. Messrs. John Carroll, James Pellenz, Robert Molyneux, John Ashton and Leonard Neale were appointed directors.

Shortly afterward an appeal was issued, entitled "Proposals to Establish an Academy at Georgetown, Potomac River, Maryland." In this circular it



was stated that "agreeable to the liberal principle of our constitution, the seminary will be open to students of every religious profession."

In 1788 the erection of the first building was undertaken, yet 1789 is commonly considered the year of the founding of the college as the deed of the original piece of ground was dated January 23, 1789. Students were not received before 1791.

Upon the reorganization of the Society of Jesus in Maryland, in 1805, the Georgetown College, as it already was called, was transferred to the fathers of that society, under whose control and direction the university still remains.

An act of congress, dated March 1, 1815, reads as follows:

AN ACT CONCERNING THE COLLEGE OF GEORGETOWN IN THE DISTRICT OF COLUMBIA.

Be it enacted by the Senate and the House of Representatives of the United States of America, in Congress assembled, That it shall and may be lawful for such persons as now are, or from time to time may be, the President and Directors of the College of Georgetown, within the District of Columbia, to admit any of the students belonging to said College, or other persons meriting academical honors, to any degree in the faculties, arts, sciences, and legal professions, to which persons are usually admitted in other Colleges or Universities of the United States; and to issue in an appropriate form the diplomas or certificates which may be requisite to testify to the admission of such a degree.

LANGDON CHEEVES,
Speaker of the House of Representatives
JOHN GAILLARD,
President pro tempore of the Senate.

Approved March 1, 1815,
JAMES MADISON.

Two years later the power of granting degrees thus acquired was first exercised.

In 1833, the Holy See empowered Georgetown to confer in its name degrees in philosophy and theology.

The next step in the development of the college was the erection and equipment of a complete astronomical observatory, in 1842, and in the following year the formal incorporation of the institution was effected in congress.

The school of medicine was opened in 1851, and the school of law in 1870. The graduate school was in existence as early as 1856.

The dental department of Georgetown University came to the greater institution in the year 1901, as an original foundation, although previous to that time several of the professors had founded what was then known as Washington Dental College. That college was organized in 1897, and among those who figured most prominently in its founding during the period of its separate existence were Drs. William N. Cogan, W. W. Evans, Elmer Weiber, Jesse Ramsburgh, Edwin R. Hodge, Charles E. Ferguson and Monte Griffith. They came together in the spring of 1897 and completed their organization, subscribed sufficient means to place the college on a secure foundation, procured a charter from the municipal authorities, rented and furnished a building and opened their first session on the first of October of the same year. The first officers were Dr. Evans, President; Dr. Weiber, Secretary and Dr. Cogan, Treasurer.

The college continued under its original name and charter for two years and gained an excellent standing, but during the same time it was felt that the

institution was entitled to rank with dental colleges of the highest order in the country, and to the attainment of this end the proprietors directed their energies. Accordingly a petition was presented in August, 1899, at the meeting of the National Association of Dental Faculties at Niagara Falls. The petition was favorably reported and the college was at once recognized by the association.

Soon after this, however, a plan was suggested by which it was proposed to combine the dental college with the medical department of Georgetown University, and, in 1901, the union was effected. The change from an independent school to one under the control of a great university was easily accomplished by the board of directors of the two institutions. During the four years of its separate existence the Washington Dental College had built up a fair attendance in students, had graduated three classes, and was known in the District of Columbia and its vicinity as a school of high reputation and standing. Among its professors and instructors were some of the foremost men of the profession in the city of Washington.

When, however, the opportunity offered, the faculty wisely determined to unite their independent school with the medical department of the university and thus avail themselves of the greater advantages to be derived from work under the direction of that institution and in that manner establish a new arm of the greater body.

The transformation was accomplished in the interval of summer vacation, in 1901. With the available assets of the former dental college there also came to the new organization such well known practical teachers of dentistry and dental surgery as Drs. Hodge, Cogan, Wall, Ramburgh, Ferguson and Evans, who, with accessions from the teaching force of the school of medicine, comprised the first dental faculty under the new order of things.

In introducing this new element of university life, the faculty of medicine, in the annual circular of information for the session of 1901-1902, made public the fact that "arrangements have been completed for the establishment of a modern and strictly first class dental department," and announced the first session to begin October 1, 1901. The department was organized to conform to the requirements of the National Association of Dental Faculties as well as to those of the National Association of Dental Examiners.

A preliminary examination equivalent to a certificate of entrance into the third year of a high school was required as a condition of admission, although this was not required of applicants who could show that they had covered the work of such examination by an official certificate to that effect issued by a reputable literary or scientific college, academy, high school or state examining

A small class of students entered the department for the session of 1901-02, but the number was sufficiently large to satisfy the faculty that the school would be more successful in later years and that the advanced methods of instruction would find favor with those who preferred a professional education of higher character than that usually furnished to institutions of its kind. The entire dental faculty for the first session included ten professors, one special lecturer and sixteen assistant demonstrators and clinicians.

The dental department completed the first year of its history in the spring of 1902, and with the school of medicine held its first commencement exercises in Gaston hall, at the college in Georgetown, on the 29th day of May of that year. Nine degrees of doctor of dental surgery were conferred by President Daugherty of the university. The valedictory of the class of '02 was given by Allen E. Cowles, D. D. S.

For the session of 1902-03 the number of students was somewhat larger than in the preceding year and the faculty remained substantially as before. The year was one of noticeable progress and there was much in the work accomplished to guarantee the permanency of the school and increased usefulness in years to come. The second annual commencement was held at the college building in connection with the exercises of the arts and sciences and medical departments of the university, on June 10, 1903. Eight degrees of D. D. S. were conferred on graduates by Father Rector Daugherty.

The session of 1903-4 was begun September 28, 1903, with eighteen matriculants divided among the three classes. The annual commencement in 1904 was held in Gaston hall, on the 7th day of June, in connection with the graduation exercises of the medical department. On this occasion eight candidates received degrees in dental surgery. The valedictorian of the class was John J. Griffin, D. D. S.

The fifth year of the dental department, the session of 1904-05, was opened with informal ceremonies on September 29, 1904, and with classes which were not large, but which contained excellent student material, as was clearly shown in the next annual examinations. At the commencement exercises held on the lawn in front of the college building in Georgetown, on June 13, 1905, six dental degrees were conferred by the president of the university.

The session of 1905-06 opened Thursday, September 28, 1905, with twenty-three matriculants in the dental school, seven in the first, nine in the second and seven in the third year class. The next annual commencement was held June 12, 1906, and at that time six dental degrees were conferred on graduates. The valedictorian of the class was Festus Joseph Nee, of Massachusetts.

The session of 1906-07 was begun Thursday, September 27, 1906, with twenty-three students in attendance and a faculty comprising ten professors, ten special lecturers and assistants, eight demonstrators and four members of the clinical staff. Of the students entered for the year, six were members of the first year, six of the second year and eleven of the third year class.

During the comparatively few years of its history, the dental department of Georgetown University has made an honorable record and has come to be regarded as one of the important elements of the university life. For several years an integral part of the school of medicine and in close alliance with that strong institution, it derived great benefits from the association and the teachings of the regular faculty of medicine, whose members from time to time have been assigned to duty in the dental department. At the same time three of the old members of the teaching force of the Washington Dental College, whose professional work antedated the alliance with the university, have retained their chairs and have themselves become closely identified with the success of the dental department during the later years of its history. The dean, Dr. Cogan, was dean and the active spirit of the older school, and has served as its executive officer since the merger was effected in 1901. Professors Ramsburgh and Wall, too, are still members of the dental faculty, the former teaching his old subject of oral surgery and the latter filling the chair of physiology.

Of the faculty as constituted in 1901, several members are still connected with the school, and the first treasurer, Dr. Kober, is yet in that office as well as being incumbent of the offices of dean and treasurer of the medical school.

The faculty at present (1908) is as follows:

REV. DAVID HILLHOUSE BUEL, S. J., President of University.

SHIRLEY W. BOWLES, D. D. S., Vice President and Professor of Prosthetic Dentistry and Orthodontia.

WILLIAM N. COGAN, D. D. S., Dean of the Faculty, Professor of Dental Technics.

GEORGE M. KOBER, M. D., Treasurer of the Faculty.

HOWARD P. COBEY, M. D., D. D. S., Professor of Operative Dentistry and Ceramics.

H. JEROME ALLEN, M. D., D. D. S., Professor of Dental Medicine and Pathology.

J. A. WATLING, D. D. S., Professor of Metallurgy and Clinical Dentistry.

JESSE RAMSBURGH, A. M., M. D., Professor of Oral Surgery.

FRANK BAKER, A. M., M. D., PH. D., Professor of Anatomy.

JOHN D. HIRD, A. M., LL. M., Professor of Chemistry and Toxicology.

EDWIN B. BEHREND, A. B., M. D., Professor of Pathology and Bacteriology.

WILFRED M. BARTON, M. D., Professor of Materia Medica and Therapeutics.

JOSEPH S. WALL, M. D., Professor of Physiology.

BARNES DENTAL COLLEGE.

ST. LOUIS, MO.

BY GEORGE H. OWEN, D. M. D., B. S. D.

Barnes Dental College of St. Louis, Mo., was organized in August, 1903, as the dental department of Barnes University. This university was not organized for financial profit, but for professional education, *per se*. It is chartered under the laws of Missouri, and has three departments—medical, dental and pharmaceutical. A law department is now contemplated.

The university has no shareholders or stockholders. The management is vested in a board of trustees, the members of which serve without remuneration. All moneys accruing from fees and other sources, with the exception of the amount necessary for salaries and running expenses, are devoted to the improvement of the institution.

The dental department was supplied from the beginning with all the requirements of a modern dental college. Commodious quarters were arranged in the six story building of the university. One section of the building was set aside for the infirmary. This was equipped with operating chairs, cuspidors, stationary washstands, lockers, etc. The laboratories were planned large enough to allow for the increase of students in after years, and equipped with electric lathes, benches, lockers, and necessary appurtenances, etc.

The length of terms has always been that prescribed by the National Association of Dental Faculties. In 1904 the National Association of Dental Examiners put the Barnes Dental College on its recommended list. The preliminary educational requirements were raised so as to make it necessary for entrance to the college for the student to have a diploma from an accredited high school or pass an equivalent examination before the representative of the state superintendent of schools. The length of the course was also raised to include thirty-two weeks, exclusive of holidays, in each year.

The college has ever maintained lofty ideals, conforming at all times to the recommendations and demands of the National Association of Dental Examiners, the National Association of Dental Faculties, and Missouri State Board of Dental Examiners.

In 1906 the board of trustees, in order to give the college better clinical facilities, built a handsome separate infirmary and laboratory building. This addition to the main building afforded easy and separate entrance direct from

the street, and resulted in an immense increase of clinical material for the infirmary.

The college has had two deans. The first was Dr. B. L. Thorpe, who served two and one-half years. The second dean was Dr. G. H. Owen, of St. Louis, who still serves in that capacity.



The members of the present (1908) faculty are:

GEORGE H. OWEN, D. M. D., B. S. D., Dean, Professor of Operative Dentistry and Dental Pathology.

O. J. FRUTH, D. M. D., M. D., Secretary; Professor of Porcelain Dental Art.

S. H. VOYLES, D. M. D., Professor of Prosthetic Dentistry and Crown and Bridge Work.

SAMUEL WILLIAMS, D. D. S., Professor of Orthodontia, Dental Materia Medica and Therapeutics.

C. O. SIMPSON, M. D., D. D. S., Professor of Embryology, Histology and Operative Technics, Oral Hygiene and Operative Dentistry.

T. G. DONNELL, D. M. D., Professor of Metallurgy, Dental Anatomy and Director of Prosthetic Laboratories.

C. P. STRAWN, D. D. S., Professor of Prosthetic Technics and Superintendent of Infirmary.

W. H. LOVE, D. D. S., Professor of Clinical Operative Dentistry and Superintendent of Infirmary.

C. M. RILEY, M. D., Professor of Chemistry and Director of Chemical Laboratories.

C. A. VOSSBURGH, M. D., Professor of General Pathology, Clinical Microscopy and Director of Pathological Laboratory.

C. M. AMENT, M. D., Professor of Oral Surgery.

W. L. DICKERSON, M. D., Professor of Therapeutics, Materia Medica, Director of Therapeutics Laboratory.

W. F. CALLFAS, M. D., Professor of Anatomy.

R. C. BLACKMER, C. M., M. D., Professor of Dental Jurisprudence.

H. C. HERRICK, PH. B., M. D., Professor of Physiology and Director of Physiological Laboratory.

G. A. REID, M. D., Professor of Bacteriology and Director of Biological Laboratory.

M. E. BRADLEY, M. D., Professor of Histology and Director of Histological Laboratory.

C. H. POWELL, M. D., Professor of Physical Diagnosis.

O. L. SUGGETT, M. D., Professor of Syphilology.

Of the original organizers and faculty, Dr. George H. Owen is the only one who has been with the college continuously.

THE STATE DENTAL COLLEGE.

DALLAS, TEX.

BY T. G. BRADFORD, D. D. S.

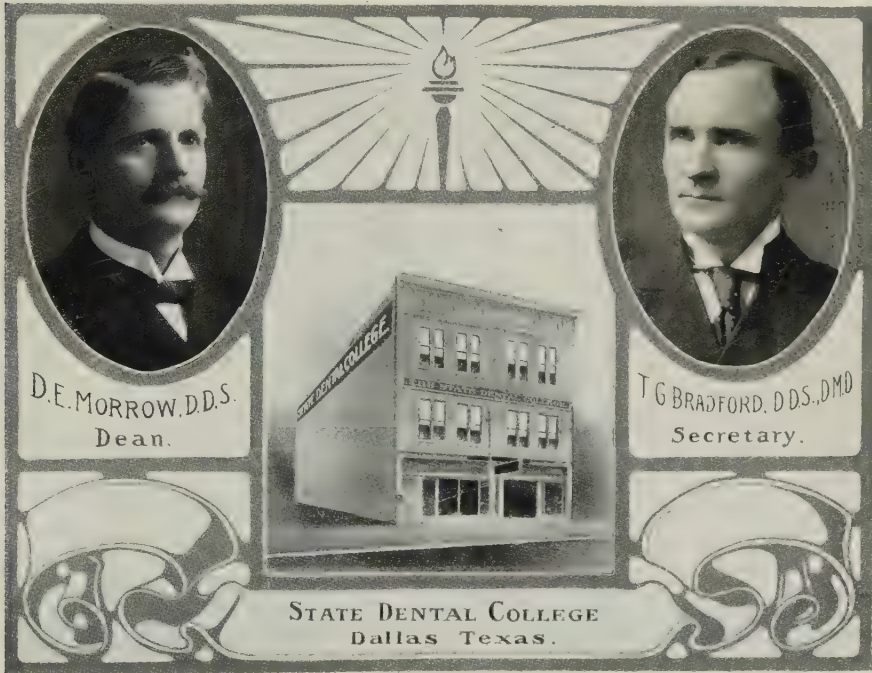
The State Dental College is located at Dallas, Texas. It was chartered February 28, 1905, under the laws of the state of Texas. During the first year of the existence of the school there were more than thirty students in attendance, during the second year the attendance more than doubled and to accommodate this increase in students another story was added to the college building. The school now has ample accommodations for 150 students, the rooms, including the infirmary, being fully equipped with all necessary appliances.

During the first two years the graduating classes were small, the graduates finishing work here that was begun in other institutions. The first year the following men received diplomas: Horace Overby, George Robert Smith and Kanematsu Tanuichi, M. D., D. D. S. The third year the graduates were: Lee A. Adams, F. W. Crone, L. W. Holland, O. M. Kevmott, T. L. Lewis, H. E. Medor, J. S. Nelson, R. B. Rodden, R. L. Watt, Jr.

The college has a laboratory for each of the three classes, two large lecture

halls, chemical and histological laboratories, and dissecting and extracting rooms.

The original board of directors was composed of the following men: D. E. Morrow, D. D. S.; T. G. Bradford, D. D. S., Dallas; H. T. King, Abilene; Leonard Isaacs, Rockdale; F. B. King, M. D., Houston. The officers were: Dr. D. E. Morrow, Dean; Dr. T. G. Bradford, Vice Dean and Secretary; Harry Tom King, Treasurer.



Dr. Morrow, formerly secretary of Marion Sims Dental College, was the founder of the State Dental College. He was assisted by Dr. Bradford, who also came from St. Louis. Much opposition was encountered among the dentists of the state, as many of them thought the time was not propitious for founding a dental college in Texas. After overcoming many difficulties some of the best men in the state were secured as members of the faculty.

Dr. Loomis P. Haskell, of Chicago, is emeritus professor of prosthetic dentistry and each year spends two weeks at the institution demonstrating metal plates and continuous gum.

The college makes every effort to teach dentistry didactically and practically, technic work being the foundation of the course.

At the beginning of the second session Dr. Morrow resigned as dean to accept the position of registrar of the St. Louis Dental College, formerly Marion Sims, and Dr. Bradford was elected acting head of the institution, which position he filled until March 20, 1908, when Dr. Morrow was re-elected dean and is the present head of the college. The graduates of that year were Oscar Lougee Smith, Elenzo H. Ramsey and Charles Beverly Slaughter, A. B.

Members of the faculty for 1908 are as follows:

LOOMIS P. HASKELL, D. D. S., Emeritus Professor of Prosthetic Dentistry and Continuous Gum.

DAVID E. MORROW, D. D. S., Dean, Professor Materia Medica.

D. JACOBI SIBLEY, D. D. S., Professor of Prosthetic Dentistry, Crown and Bridge.

THOMAS G. BRADFORD, D. D. S., D. M. D., Professor Orthodontia and Dental Anatomy.

CHARLES L. MOREY, D. D. S., Professor Operative Dentistry.

J. C. CHISHOLM, B. S., P. D., Professor Chemistry and Metallurgy.

CHARLES F. BARHAM, D. D. S., Professor Clinical Dentistry.

S. R. MILLIKEN, M. D., Professor Anatomy.

J. H. BLACK, M. D., Professor of Physiology.

W. D. JONES, M. D., Professor General Pathology, Oral Surgery and Bacteriology.

FRANK B. KING, Ph. G., M. D., Professor of Surgery.

J. M. MARTIN, M. D., Professor of Electro Therapeutics and X-Ray.

HON. H. W. PECK, Professor of Dental Jurisprudence.

A. B. SMALL, M. D., Professor of Clinical Surgery.

TEXAS DENTAL COLLEGE.

HOUSTON, TEX.

BY O. F. GAMBATI, D. D. S.

The Texas Dental College was chartered under the laws of the state of Texas on February 11, 1905. The incorporators were O. F. Gambati, Thomas P. Williams, Charles H. Edge, M. J. Lossing, E. M. Armstrong, R. T. Morris and W. A. Haley. These men, being legally authorized to establish a "college of dentistry for the instruction and graduation of students in dentistry and dental surgery," leased and equipped a building in the business district of Houston and began therein the work of the Texas Dental College.

Plans are being drawn for a new building which it is hoped to have completed in another year. The college has an enrollment of thirty-five.

The members of the faculty for 1908 are:

O. F. GAMBATI, D. D. S., Dean; Professor of Dental Anatomy, Dental Histology and Orthodontia.

THOMAS P. WILLIAMS, D. D. S., Professor of Operative Dentistry, Dental Surgery and Hygiene.

CHARLES H. EDGE, D. D. S., Secretary; Professor of Dental Pathology, Dental Materia Medica, Therapeutics and Crown and Bridge Work.

CHARLES A. LEE, D. D. S., Professor of Prosthetic Dentistry and Dental Metallurgy.

R. T. MORRIS, M. D., Professor of Anatomy, Materia Medica and Therapeutics.

E. M. ARMSTRONG, A. B., A. M., M. D., Professor of Oral Surgery, Physiology and Hygiene.

WILLIAM A. HALEY, M. D., Professor of Histology, Pathology and Bacteriology.

A. T. HUNT, PHAR. D., Professor of Chemistry.

M. S. MERCHANT, D. D. S., Professor of Clinical Dentistry.

GAVIN HAMILTON, M. D., Demonstrator of Anatomy.

A. J. BAUMHARDT, PH. C., M. B., M. D., Demonstrator of Bacteriology, Pathology and Histology.

M. S. MERCHANT, D. D. S., Demonstrator in Infirmary.

W. H. SCHERER, D. D. S., Demonstrator and Instructor in Operative Technique.

R. R. RATLIFF, D. D. S., Demonstrator of Prosthetic Technique and Gold and Porcelain Bridge Work.

J. W. SCOTT, B. S., M. D., Lecturer on Local and General Anesthetics.

R. W. KNOX, A. M., M. D., Lecturer on Surgical Diagnosis and X-Ray Work.

JOSEPH MULLEN, M. D., Lecturer on Diseases of the Sinuses of the Head and Face.

GEORGE B. GRIGGS, B. L., M. S., Lecturer on Dental Jurisprudence.

CREIGHTON DENTAL COLLEGE.

OMAHA, NEBR.

BY W. P. WHELAN, S. J.

The Dental Department of Creighton University in Omaha, Nebraska, was opened on Monday, October 2, 1905. A building was erected opposite the city hall in Omaha for the use of the dental and law departments of the university. This is called the Edward Creighton Institute in honor of the founder of Creighton University.

Three stories of this building are devoted to dental work. The laboratories, lecture rooms and infirmary are fitted out with complete modern equipment.

The professors of Creighton Medical College have charge of the depart-

ments of histology, pathology, physiology, bacteriology, chemistry, metallurgy, oral surgery, materia medica, therapeutics, physical diagnosis, general anaesthesia, anatomy and dissection.

The faculty of law provides for instruction in dental jurisprudence.

The faculty of philosophy treats moral principles and dental practice and deals with the ethical aspects of the dental profession.

Instruction in operative and prosthetic dentistry is given by a staff of teachers including the best known dentists of Omaha and vicinity, in addition to the demonstrators who devote the whole time to the instruction of students.

The dental department of Creighton University has no endowment, but it is hoped that in the near future sufficient funds may be set aside to make it a partially endowed department.

In the summer of 1906, Creighton Dental College acquired the stock and equipment of the Omaha Dental College and the latter institution became a part of the Creighton Dental College. The Creighton faculty was strengthened by the addition of professors from the school it absorbed, and has been recognized by the National Board of Dental Examiners.

In 1906 it had one graduate, in 1907 there were twenty-six, and in 1908 forty-five.

Following are the officers and faculty for 1908 of the Creighton Dental College:

- EUGENE A. MAGEVNEY, S. J., President of the University.
- A. H. HIPPLE, D. D. S., Dean.
- A. W. NASON, D. D. S., Vice-Dean.
- WILLIAM P. WHELAN, S. J., Regent.
- A. H. HIPPLE, D. D. S., Professor of Operative Dentistry and Dental Therapeutics.
- A. W. NASON, D. D. S., Professor of Clinical Dentistry.
- C. E. WOODBURY, D. D. S., Professor of Dental Porcelain and Gold Inlays.
- G. W. HAMILTON, D. D. S., Professor of Prosthetic Dentistry and Prosthetic Technics.
- W. H. TUTTLE, D. D. S., Professor of Orthodontia, Crowns and Bridges.
- E. H. BRUENING, D. D. S., Professor of Dental Anatomy.
- J. S. FOOTE, A. M., M. D., Professor of Pathology, Histology and Clinical Microscopy.
- C. O'NEILL RICH, B. S., M. D., Professor of Oral and General Surgery.
- W. L. ROSS, M. D., Professor of Dental Neurology.
- A. L. MUIRHEAD, M. D., Professor of Physiology and Pharmacology.
- M. LANFELD, A. B., M. D., Professor of Bacteriology and Embryology.
- GUSTAV HAHN, Ph. G., M. D., Professor of Materia Medica and Therapeutics.
- A. SACHS, M. D., Professor of Anatomy.
- J. E. SIMPSON, M. D., Assistant Professor of Anatomy.
- D. C. BRYANT, A. M., M. D., Diseases of the Antrum and Accessory Sinuses.

EDMUND THORP, M. S., Ph. G., Professor of Chemistry and Metallurgy.

PAUL L. MARTIN, A. M., LL. B., Lecturer on Dental Jurisprudence.

A. C. BUNCE, M. D., Professor of Dental Medicine.

A. W. NASON, D. D. S., Superintendent of Clinics.

LAVAL UNIVERSITY SCHOOL OF DENTISTRY.

MONTREAL, QUE.

BY EUDORE DUBEAU, B. S., L. D. S., D. D. S.

Dentistry was recognized as a profession in the province of Quebec by an act of parliament passed in 1869. By this act the dentists practicing at that time were incorporated, and the board of directors given the power to require matriculation and final examination from those wishing to enter the dental profession. The principal organizer of this movement was the late Dr. George Beers, who up to the time of his death, ten years ago, was intimately connected with all dental affairs in this province.

From 1869 to 1893 there was no dental college in the province of Quebec, the students attending only one course of medical lectures on anatomy, physiology, chemistry and dissection of the head and neck in either Laval or McGill university.

In 1893 another act of parliament authorized the establishment of a dental college having two staffs of teachers—one French and the other English. The degree of Doctor of Dental Surgery was given by Bishop University, with which the college was affiliated. This college was very hard to manage on account of the teaching being in two languages. It existed for ten years, however, under the supervision of the board of examiners of the Dental Association of the Province of Quebec.

In 1903 the boards of governors of Laval (French) and McGill (English) universities were approached and accepted a proposition to establish a dental faculty in each institution. An act of parliament was passed that same year ratifying such an agreement. The Laval University School of Dentistry has existed from that time.

This is the only school in America giving dental education in the French language. The course extends over four years. Students are obliged to dissect the whole body and attend at two complete courses in anatomy, physiology and chemistry. The degree conferred by the school is Doctor of Dental Surgery. Every year since its establishment the school has had students from Europe in attendance.



Laval University
School of Dental Surgery
Montreal Canada -



Eudore Dubeau
B.S., L.D.S., D.D.S.
Founder
and
Dean



- Laboratory -



- Clinic Room -

In 1906 the school applied for membership in the National Association of Dental Faculties and was admitted at the meeting of the association the following year.

The organizer of the school is the present dean, Dr. Eudore Dubeau, ex-president of the Canadian Dental Association and honorary member of the Paris Dental School. The registrar is Dr. Joseph Nolin, and the secretary Dr. J. G. A. Gendreau.

The school is located in Laval University in St. Denis street, in the city of Montreal. Only French speaking students are accepted.

The faculty for 1908 is composed as follows:

EUDORE DUBEAU, D. D. S., Dean, Professor of Pathology and Oral Surgery.

JOSEPH NOLIN, D. D. S., Registrar, Professor Operative Dentistry, Bridge Work, and Porcelain.

J. G. A. GENDREAU, D. D. S., Secretary, Professor of Metallurgy, Prosthesis, Dental Anatomy.

G. H. KENT, D. D. S., Professor of Orthodontia.

L. FRANCHÈRE, D. D. S., Professor of Therapeutics and Materia Medica.

A. BEAUCHAMP, D. D. S., Professor of Anesthesia.

F. A. HARWOOD, D. D. S., Professor of Dental Technic and Librarian.

A. BERNIER, M. D., Professor of Physiology, Bacteriology and Hygiene.

J. P. DÉCARIE, M. D., Professor of Histology.

ALP. DÉCARY, LL. B., E. R., Professor of Jurisprudence.

ALBERT DUHAMEL, M. D., Professor of General Anatomy.

LÉO PARISEAU, M. D., Professor of Chemistry and Physics.

RENÉ HÉBERT, M. D., Professor of Auscultation.

A. LABELLE, D. D. S., Superintendent of the Infirmary.

G. A. BÉLANGER, D. D. S., Instructor at the Infirmary.

J. A. SANTOIRE, D. D. S., Instructor at the Infirmary.

L. J. B. LEBLANC, D. D. S., Curator of Museum.

McGILL UNIVERSITY COLLEGE OF DENTISTRY.

MONTREAL, QUE.

BY PETER BROWN, L. D. S.

The Dental Association of the Province of Quebec was incorporated in 1869, from which period until 1892, students in dentistry received their education either solely under the system of indentureship provided for by the terms of the dental act incorporating the association, or else went abroad.

In 1892 the Dental College of the Province of Quebec was established and

became affiliated with the University of Bishop College, Lennoxville, which union was maintained until 1903, when the dental association, deeming it to be to the best interests of the profession, entered into negotiations with the University of McGill for the purpose of creating a dental department under the supervision and control of the medical faculty. The arrangements between the dental association and the board of governors of the University of McGill were completed in 1904. The opening lecture of the dental department of the university was given by Dr. F. A. Stevenson, president of the dental association, on September 29, 1906. Four matriculants began the course the first year.

The dental department is not constituted a faculty, but is under the supervision and control of the medical faculty.

Under the regulations that have been established governing the dental department, students may register in dentistry after passing the matriculation required of students of medicine in McGill University, but those wishing to practice in the Province of Quebec, except those who hold a degree in arts from a recognized British or Canadian university, must pass the matriculation examination of the College of Dental Surgeons of the Province of Quebec.

The course demanded of students in this department extends over four years and leads up to the degree of Doctor of Dental Surgery. In the first year the curriculum is that demanded of students in the medical faculty for the same period, and includes anatomy, biology, chemistry and physics, histology, embryology and bacteriology. In the second year students of dentistry finish their course in anatomy at Christmas, special attention being paid to the anatomy of the head and neck. The course in chemistry is not so extensive as for the medical student and includes courses of lectures on organic and bio-chemistry. Special lectures are given in physiology, pharmacology and histology. Pharmacy is as in the medical course. There are also courses in operative dental technique, prosthetic technique and dental anatomy for second year students. The practical work of the last two years is conducted at the dental college, special courses of lectures being delivered at the McGill Medical College. In the final year, clinics are given in the Montreal General and Royal Victoria hospitals, where the student has an excellent opportunity of studying pathological conditions of the oral cavity and witnessing operations on the mouth and jaws.

The general sciences are taught by the faculty of medicine.

The following constitute the members of the special dental faculty:
FRANCIS J. SHEPHERD, M. D., D. D. S., Dean, Prof. of Anatomy.

PETER BROWN, L. D. S., Professor of Dental Anatomy, Dental Histology and Dental Surgery. D. JAMES BERWICK, D. D. S., L. D. S., Professor of Operative and Prosthetic Dentistry. FRED G. HENRY, D. D. S., L. D. S., Professor of Dental Materia Medica and Therapeutics and Dental Pathology. JAMES B. MORISON, D. D. S., L. D. S., Professor of Orthodontia and Crown and Bridge Work. F. H. A. BAXTER, D. D. S., L. D. S., Demonstrator of Prosthetic Dentistry and Crown and Bridge Work. GEORGE CAMERON, L. D. S., D. D. S., Demonstrator of Operative Technique and Operative Dentistry.

During the Session of 1907 to 1908 twelve Students attended the dental department of whom three received the degree of Master of Dental Surgery.

Since then the University of McGill has decided to confer the degree of Doctor of Dental Surgery upon its successful candidates in dentistry, replacing that of Master of Dental Surgery heretofore bestowed.

MARITIME DENTAL COLLEGE.

HALIFAX, N. S.

BY GEORGE K. THOMSON, D. D. S.

The Maritime Dental College was established in the city of Halifax, Nova Scotia, in 1908. The first session opened on September 1st of that year. The college occupies very convenient quarters in the main building of Dalhousie University, with which it is affiliated. It holds affiliation also with the Halifax Medical College.

From these institutions dental students receive instruction in the subjects that are common to arts, science, medicine and dentistry. The well equipped laboratories of chemistry, physics, biology, histology, and bacteriology and practical anatomy are available for dental students. The dental subjects are taught in the dental college apartments, where the infirmary and laboratories are situated.

The college is operated by the Provincial Dental Association, but all the maritime provinces are represented on the lecture staff.

A course of four years is conducted. The first two years are of eight months. The third and fourth years are of seven months duration. A high

standard is maintained in every department of the work. The course of instruction is endorsed by the Dominion Dental Council of Canada.

The Dean of Maritime Dental College is Dr. Frank Woodbury, and the recording secretary, Dr. G. K. Thomson.

Dalhousie University confers the degree of Doctor of Dental Surgery. The university faculty of dentistry conducts all examinations.

ANGLE SCHOOL OF ORTHODONTIA.

By FREDERICK B. NOYES, A. B., D. D. S., CHICAGO.

Dr. Angle was the first man to realize that orthodontia and general dentistry were radically different and constituted in reality separate specialties of medicine—dentistry being the study of the diseases of the mouth; orthodontia the study of the relationship of the teeth to the development of the face. To him it was not a part of dentistry, but a sister profession.

Dr. Angle has told in his own words the conditions which led up to the establishment of the Angle school and I will include that, as it was given by himself. But one who has looked at orthodontia only from the view of dentistry, cannot, I believe, understand this development. "In 1880 I had become very much interested in orthodontia, and I came to believe that some time, perhaps after a long time, orthodontia would be practiced as a specialty, for it seemed to me that its importance entitled it to a closer study and application in practice and that only this would enable anyone to become sufficiently familiar with its principles and master of its technic, to overcome its difficulties and be successful in its practice. This conviction has constantly grown upon me in the years that have followed.

"In 1896 I advocated its teaching and practice as a specialty in a paper before the Western Pennsylvania Dental Association, which was published in the "Dental Review." My experience in teaching orthodontia in four different dental colleges, covering a period of thirteen years, convinced me that it was impossible ever to successfully teach it to dental students. This is abundantly proven, I think by the fact that although orthodontia has been a part of the curriculum of all the dental colleges from Harris' time down, not one dental student in all that time has gained sufficient knowledge of the subject in the dental college to enable him to practice it with sufficient success to make it his sole means of gaining a livelihood, in spite of the immense number of these deformities in every community.

"During all my association with dental colleges as a teacher of this branch, I earnestly endeavored to awaken a deep interest in the work among the students, only to find the students interest gradually to relax and, in a large percentage of cases, to end in failure and disgust. This seemed to me largely due to two causes; first, the students energies were dissipated in so many branches of study, and second, that orthodontia and dentistry are so very dissimilar in their requirements of teaching and practice. It now seems to me, as I review my experience in teaching orthodontia to dental students, that I not only failed of being of much assistance to them, but that in most instances what I taught them was a positive injury, for at best it only made smatterers of them, which could only lead to failure in their practise.

"I then tried hard to impress the management of the dental departments of Northwestern University and the University of Pennsylvania with the desirability of their forming special departments devoted exclusively to the study and practice of orthodontia. I proposed that orthodontia in these institutions should be made optional; those having an aptitude and liking for the work, giving after the second year, their entire time to its study and practice. The answer was, always, "This is too Utopian," or "It is too early."

"Having become entirely discouraged with my experiences in dental colleges, I became filled with the belief that if orthodontia was to make any material progress, a separate school, entirely independent of dental schools, must be formed, which would amply provide opportunity for those with aptitude and liking for the subject to study it in a broad, thorough and comprehensive manner, and where it would be relieved from all the blighting, handicapping influences which are necessarily thrown around it in dental colleges. Hence was founded the Angle School of Orthodontia."

In the summer of 1899, at the meeting of the National Dental Association at Niagara Falls, a few young men became very much interested in Dr. Angle and his idea of orthodontia. As a result of the interest awakened, four young men, Drs. Thomas B. Mercer, Henry E. Lindas, Milton T. Watson, and Herbert A. Pullen, went to St. Louis and spent about three weeks with Dr. Angle in his office. This was the very humble beginning of the Angle School of Orthodontia, but without equipment and without any of the machinery of a school, they had received the greatest service that a school can render for they went away prepared to think and to work. Dr. Angle inspired them with the belief that orthodontia has a deep foundation in scientific truths and that its successful practice was dependent upon the acquirement of a technical skill, beautiful in its accuracy and perfection, and guided by an artistic judgment of the finest quality.

In May, 1900, these four men, together with seven others, returned for the first session of the Angle school. Dr. Angle recognizing the relation of orthodontia to rhinology, had interested Dr. Thomas Rumbold, "the Father of Rhinology," in the subject and he delivered a course of lectures on the subject. Dr. Alton H. Thompson, of Topeka, Kan., was also of the faculty of the first session, as lecturer on comparative anatomy, and Professor E. H. Wuerple, of St. Louis, lectured on facial art.

In 1901 no one was found in the world desirous of taking the course, and since that time the classes have ranged from about nine to eighteen in number, the limit having always been set at twenty. In the development of the school, Dr. Angle has attracted to himself men interested in the underlying sciences, and has made them interested in orthodontia. The last session of this school was held in New York City.

Following is the faculty of the session of 1908:

EDWARD H. ANGLE, M. D., D. D. S., *President*, St. Louis, Mo.; *Orthodontia*.

FREDERICK LESTER STANTON, D. D. S., *Secretary*, New York City; *Superintendent and Assistant Instructor in Rhinology*.

MARTIN DEWEY, M. D., D. D. S., Kansas City, Mo.; *Lecturer on Anatomy, Assistant Instructor in Histology and Comparative Anatomy, and Instructor in Clinic and Technique*.

FREDERICK B. NOYES, A. B., D. D. S., Chicago, Ill.; *Embryology and Histology*.

RAYMOND C. OSBORN, PH. D., Columbia University; *Comparative Anatomy*.

ANTONIE P. VOISLAWSKY, B. S., M. D., New York City; *Rhinology*.

MR. EDMUND H. WUERPEL, *Director School of Fine Arts*, St. Louis, Mo.: *Art*.

A. H. KETCHAM, D. D. S., Denver, Colo.; *Special Lectures and Demonstrations in Photography and the X-Ray*.

MR. E. B. CORE, New York City; *Special Lectures on Photography*.

THE RISE AND PROGRESS OF DENTAL EDUCATION IN MEXICO.

BY DR. JOSE J. ROJO, CITY OF MEXICO.

Innumerable were the cities founded in Mexico, and varying the degrees of civilization reached by them up to the last days of their prosperity. However, archaeological discoveries and the few trustworthy data we possess

enable us to state that they all practiced the arts and sciences in some form or other.

The Aztec race, owing to its iron-like constitution, suffered from very few affections of the mouth, but notwithstanding this fact its physicians performed numerous dental operations.

The Aztecs were familiar with dental pathology and therapeutics, for they knew the properties of a multitude of herbs and prepared them in different ways for the treatment of their ailments. Señor Flores cites the names of a vast number of medicinal plants in his works. It is certain beyond all doubt that they treated stomatitis, bad breath, toothache, caries and other affections.

With regard to surgery, there is a fact the importance of which can never be adequately expressed to the dentist who is at all interested in the history of his profession; that fact is the following:

Professor Batres has in the course of his archaeological explorations encountered very many specimens of human teeth which reveal the degree of culture in dental surgery attained by some of the Aztec tribes. These specimens form a collection of upper human incisors which Professor Batres classifies according to the place of their discovery, as follows: Zapotecas, teeth with inlays of iron pyrites; Mayas, inlays of jade; Taracos, with a groove in the center of the cutting edge; Totonacos, with two grooves in the cutting edge. Professor Batres states that he also found an example of interstitial metallic filling between the molars of one of these crania.

The first specimen is an upper left incisor with an incision in the form of a right angle at the approximal and distal angles of the tooth, thus forming a surface which is the exact reverse of that of nature, there being two right-angled incisions extending throughout the entire thickness of the tooth instead of a round and more or less acute edge. These incisions are not only symmetrical, but also present a perfectly polished surface.

In the center of the labial face of the tooth there is an inlay of iron pyrites three millimeters in diameter, symmetrically placed, perfectly circular, and marvelously well fitted; the edges of the inlay are in perfect adaptation to those of the cavity and no adhesive substance can be detected.

It is wonderful that after such an immense lapse of time the tooth and inlay still hold together, owing either to the perfect adjustment or to the presence of some intervening substance.

I shall make one of the inlaid specimens the subject of a few essential observations. It is a canine tooth from the same source as those already described. It also had an inlay, which has fallen out; it has no incisions on its cutting edge. The cavity, which is circular and perfectly cut, occupies over

half the crown of the tooth; its exterior diameter is exactly five millimeters, that of its interior is slightly greater, and it has a general depth of about a millimeter and a half.

The cusp is worn away by natural use, this wear extending to the lower border of the cavity made for the inlay. The root of this tooth is porous, its vertex truncated, and its surface rough. A comparison of this tooth with the sound and compact root of another tooth from the same cranium indicates that its root was affected by some morbid process, perhaps caused by the falling out of the inlay and the death of the pulp.

The fact that these remains were found in earthen vessels, that the crania and other bones contained in the latter are painted red, and the places in which they were found, seem to demonstrate that it was an infrequent operation, perhaps only performed on rulers or priests, or that it was a religious emblem. It may also be taken for granted that it was an operation only performed in the last years of the zenith of progress and prosperity of these races, as the specimens encountered are not numerous.

We can assert after a close study of these specimens that some of the aboriginal races of this continent practiced operations of a most delicate nature upon the teeth, attaining a very high degree of perfection in their execution, which shows that they were acquainted with the anatomical structure of the teeth, and possessed instruments and the other necessary means for making these inlays, which are a wonderful surprise to those who see them.

Consequently, we can affirm that the Aztecs knew and practiced pathology, therapeutics, and something like dental surgery.

Shortly after the conquest, the corporation of the city of Mexico, on January 13, 1523, agreed upon the following resolution: "This day the said gentlemen, acting on the petition of Francisco de Soto, barber and surgeon, ordered that as long as it were the pleasure of the said council the salary of fifty dollars in gold a year to be assigned to him, and paid to him in three instalments, in consideration whereof the said Soto shall reside in this city and here practice his trades." According to Dr. Flores this was the first decree regarding medical studies in Mexico ever issued by the authorities.

Between the years 1551 and 1553 of the viceroyalty, the Spanish government issued a decree ordering the foundation of a university in Mexico. During the early years of its existence this institution devoted all its efforts and resources to the teaching of theology, and it was not until the year 1580 that the first professorship of medicine was founded. However, a long period elapsed before medicine was properly taught; a perusal of historical data tells us that it was only in 1816, or six years after the declaration of independence,

that there were four professorships of medicine, and it is only after that date that medicine can be said to have had a special course devoted to it.

At that time the study and practice of medicine were divided among the following: Physicians, surgeons, pharmacists, phlebotomists, bone-setters, and midwives. Physicians and surgeons were obliged to study and graduate at the university; the others were required to possess the rudimentary knowledge necessary for their trade, and had to give a practical demonstration before the college of physicians to be able to obtain a license or diploma authorizing them to practice their trade.

The above regulation, with very slight modifications, existed during a great many years. In 1833 one of the first presidents of the republic ordered the university to be closed.

The closing of the university that had existed so many years must have caused great agitation at the time, but the president, Doctor Gomez Fariaz, thoroughly convinced of the wisdom of his orders, shortly afterward—that very same year, in fact—ordered an institution of medical sciences to be founded. This was without question the beginning of the era of progress of medicine in Mexico.

The professions of pharmacy, obstetrics, and phlebotomy did not receive any great benefit during that early period, and continued subject to the regulations of the epoch of the university, with very slight modifications.

The studies of the phlebotomists and dentists, formerly called barber-surgeons, were but slightly changed during that period.

In the course of the years 1841 to 1866, the profession of phlebotomy became gradually substituted by that of dental surgery; the records of that period show that there were examinations for both of those professions, but after 1866 there were no more candidates for the examination in phlebotomy, while the applicants for dentistry increased considerably.

The instruction in dentistry continued to improve during the last stages of this period, for although there were no special courses for the study of that profession, the candidates could acquire the necessary knowledge, as a group of physicians (nearly all being professors of the school of medicine) gave private classes of descriptive anatomy, dissection, histology, bacteriology, therapeutics, and dental surgery; besides this, the candidates had to present to the secretary of the school, together with their application for an examination, a certificate sworn before a notary testifying that they had practiced all the surgical and prosthetic operations in the surgery of a qualified dentist. If this application was admitted the candidate was examined in order to test his proficiency, and in the event of his being successful the department of public instruction gave him a diploma.

The latest stage in the evolution of the dental profession in Mexico began in 1896. At about that time several corporations and some private persons approached the president of the republic and the minister of justice and public instruction with petitions asking for the establishment of a special school for the teaching of dentistry.

The government, realizing the necessity of the proposed institution, appointed a commission, formed by the eminent doctors of medicine, Don Manuel Carmona y Valle, Don Rafael Lavista, and Eduardo Liceaga, to reform the plan of studies of the school of medicine, and at the same time consider the best manner of regulating the study of dental surgery.

In 1896 the well-known engineer, Don Sebastian Camacho, aided the efforts of a group of dentists by furnishing the necessary funds for the establishment of a private school of dentistry. The school was not properly organized and was closed after an ephemeral existence of four or five months.

About two years later, Dr. Soriano, a dentist, established a private dental college; but it did not flourish, and shared the same fate as the other.

In the very first year of the foundation of the Mexican Dental Society, one of its members, Juan Falero, was the first to advance the idea of forming a dental school. On September 7, 1898, Drs. Carmona and Engberg made a motion that a petition be addressed to the president of the republic, protesting against the existing regulations affecting the study of dental surgery and the examinations.

On November 25, 1898, the project of founding a dental dispensary was discussed. The idea was to afford students of dentistry opportunities for practice, and at the same time to provide a suitable place in which the poor could be treated, and the society also hold clinics and sessions. In the session of December 7, 1898, the plan of founding a dispensary was approved, Dr. Carmona being elected its director and Dr. Reguera its secretary and treasurer.

December 5, 1900, Dr. F. Pastor returned, after having attended the international dental congress in Paris as an official delegate. Dr. Pastor sent a report to the president of the republic on the result of his mission, and explained to him the imperative necessity of a dental college in Mexico.

November 28, 1901, the president of the society informed the assembly that Dr. Liceaga, the director of the National School of Medicine, had asked the society to appoint a commission of its members to formulate a plan of studies and regulations for the profession of dental surgery, and to make out a list of the equipment required for the future school.

February 12, 1902, it was announced that the plan of studies presented

had been officially adopted and incorporated into the laws of the country and duly promulgated in the official gazette (*Diario Oficial*).

September 24, 1902, the government commissioned the writer of this paper to visit and study the dental colleges of the United States of America. His report was officially published in the "Bulletin of Public Instruction" of March 10, 1903.

On January 11, 1902, the president of the republic, in the law referring to the course of study to be followed in the National School of Medicine, ordered the courses for the study of dentistry to be included in the plan, and that the necessary professorships be established.

The founders of the dental school, the advent of which marks the beginning of a new era in the annals of Mexican dentistry were: The president of the republic, who as a lover of all that tends to progress and improvement, cordially greets and esteems all that redounds to the benefit of the nation; the secretary of justice and public instruction, Lic. Don Justino Fernandez, who facilitated the necessary appropriations and personally inaugurated the new institution; the sub-secretary of justice and public instruction, Lic. Don Justo Sierra, who exerted all his efforts in behalf of its foundation; Dr. Don Eduardo Liceaga, the director of the National School of Medicine, who lent his vast scientific knowledge toward the creation of the new school.

In conclusion I must express a kind acknowledgment to the faithful members of the Mexican Dental Society who witnessed the realization of their ideal.

This institution, called the "Consultorio Nacional de Enseñanza Dental," and inaugurated April 16, 1904, is a branch of the National School of Medicine, and with it forms a part of the general scheme of professional schools, owing to which fact it is closely related to the superior board of public education and the National Preparatory School.

The National Preparatory School is a preparatory institution for the professional schools. No students are admitted unless they have completed their primary or elementary education. All applicants for admission into the professional schools must present a certificate testifying that they have studied and passed an examination of all the courses of the preparatory school.

The curriculum extends over a period of six years. The building is divided into twelve compartments conveniently arranged. In all subjects oral, objective, and experimental or practical methods are employed.

Following are the subjects studied by dental students at the school of medicine:

First year.—Descriptive anatomy and dissection; histology, especially that of the elements of the mouth.

Second year.—Topographical anatomy, that which refers to dental surgery; physiology, morbose processes.

Third year.—Bacteriology and microscopy.

The methods of instruction at the National School of Dentistry are essentially practical and are divided into two parts. The oral methods consist of lectures amplified by the use of text books, and always illustrated by the objective system. The practical methods consist of clinics and the execution of all the surgical and prosthetic operations under the supervision of the professors. The subjects studied are:

First year.—First course of dental surgery; first course of prosthetic dentistry; dental metallurgy.

Second year.—Dental materia medica; second course of operative dentistry; second course of prosthetic dentistry.

Third year.—Dental pathology; dental surgery, third course; third course of dental prosthesis; special course in orthodontia.

Besides the above, the students practice at the general hospital whenever the professors and director consider it necessary.

The curriculum is divided into three separate years. The classes meet on January 7th and close on September 30th. The sessions are suspended on national holidays and for a week in spring.

SCHOOLS OF ENGLAND AND FRANCE.

Institutions for teaching dentistry have been established in almost every civilized country. The scope of this work, however, does not permit a detailed account or history sketch of all of these.

Dr. H. L. Ambler, of Cleveland, Ohio, about ten years ago wrote an article on dental schools abroad, in which he gave an account of the institutions for the education of dentists in Great Britain and France. The following is taken from that article:

The Edinburgh Dental Hospital founded in 1892 at the time Dr. Ambler wrote, had sixty-four students. It is considered a public charity and is supported in part by an appropriation of the town council. There are also dental hospitals at Newcastle; at Liverpool; at Birmingham; at Plymouth; at Exeter and at Manchester. At Bristol there is the Royal Infirmary Dental Department; at Dublin, the Dental Hospital and School of Ireland. This latter institution, together with the Royal College of Surgeons, Ireland, grants a diploma of dental surgery.

The Dental Hospital of London, Leicester Square, is also supported by voluntary subscriptions. It was founded in 1858, and is open daily, excepting Sundays. In this Hospital the British Dental Association and the Odontological

Society of Great Britain have held their meetings for years. Students entering this hospital do so with the understanding that they intend to obtain the dental diploma of the Royal College of Surgeons, England. After they have passed the preliminary examination in science, they must be apprenticed to a registered dentist for three years before they can register as a dental student, or they may be apprenticed or indentured to the dental hospital for three years, paying two hundred and fifty dollars yearly; after that they may enter a dental and general hospital, and receive the degree of L. D. S. (Licentiate of Dental Surgery). The diploma fee is one hundred dollars. After that they may remain as students, pass examinations from time to time for two years and become eligible for the degree of M. R. C. S. (Member Royal College of Surgeons), for which the diploma and examination fees amount to one hundred and seventy-five dollars.

"Each student was required to make two hundred fillings per year; twenty-five of them in 'dead teeth;' also six artificial dentures; two cases of regulation and two pivot teeth."

The National Dental Hospital and College of London, was founded as a hospital in 1861, and as a college in 1877. The college provided all the special dental lectures required for a dental diploma of the Royal College of Surgeons, England, and admits ladies as students. Before students are admitted, they are required to pass an examination in English grammar and composition; Latin grammar and translations of easy passages; arithmetic, including fractions; algebra, simple equations; geometry, 1-2-3 books of Euclid; elementary mechanics of solids and fluids; elements of statics; dynamics, hydrostatics, and one of the following subjects: Greek, French, German, Italian, logic.

Guy's Hospital Dental School, near London Bridge, has been in operation since 1889, and in 1890 a special building was erected for its use. Guy's Hospital was founded in 1722. Its endowment fund now exceeds one million dollars. The preliminary examination for entering its dental and medical schools are the same. The surgical and medical staff of Guy's Hospital at the time Dr. Ambler wrote, included three dental surgeons, and a special ward was devoted to dental surgery.

The Dental School of Paris was opened in 1880. Its sessions open in November and close in June. Conditions for admission to this school were: First, to have a state diploma; second, to have been a practitioner with the legal right to practice in France or elsewhere, or to have a dental or medical title. The degree conferred is D. E. D. P. (Diploma de l'Ecole dentaire de Paris). Students from recognized dental schools are allowed to enter the second or third year. The course lasts three years.

There is also another dental college in Paris, the Ecole Odontotechnique.

It was opened in 1879. The course covers three years, and its requirements are similar to those of the other college.

INSTITUTE OF DENTAL PEDAGOGICS.

BY D. M. CATTELL, D. D. S., NASHVILLE, TENN.

The Institute of Dental Pedagogics was organized at the World's Columbian Dental Congress held in Chicago in 1893, following the reading and discussion before the section of the congress on operative dentistry of a paper on "Operative Technics" by Dr. D. M. Cattell, of Chicago, Ill.

The movement which resulted in the formation of this society was in reality started five years earlier when Dr. G. V. Black, of Chicago, read a paper on "Outlines of a Course of study in Operative Dental Technics," at a meeting of the Odontological Society of Chicago, held June 19, 1888. This paper of Dr. Black caused unusual comment and discussion among the profession and was the impulse which led to the scientific classification, study and development of this important branch of the college curriculum.

The paper read by Dr. Cattell at the Columbian Dental Congress was the first written on the subject following the one by Dr. Black in 1888. It was discussed by Drs. H. P. Carlton, Andrew Rose, T. E. Weeks, H. A. Smith, Don M. Gallie, G. V. Black and Otto Arnold. After the author had closed the discussion, Dr. Weeks suggested that there be a meeting of all those interested in teaching technics in some convenient room later in the day.

So in room 39 of the Art Palace of the World's Columbian Exposition, Chicago, Friday, August 18, 1893, at 4:30 p. m., there gathered together the following gentlemen: Drs. T. E. Weeks, H. W. Morgan, J. A. Dale, D. M. Cattell, W. H. Whitslar, G. H. Wilson, H. P. Carlton, Jonathan Taft, H. A. Smith, Francis Peabody, J. B. Willmott, A. Rose, T. W. Brophy, L. S. Tenney and W. E. Harper, fifteen in all, representing eleven dental schools.

Dr. Weeks stated that the object of the meeting was to organize a society of teachers of technics. Dr. H. A. Smith was selected as temporary chairman and Dr. J. A. Dale secretary. After short talks by the gentlemen present, Dr. Whitslar moved an election of temporary officers. This resulted in the election of Dr. Cattell president and Dr. Dale secretary.

The president appointed a committee of three, consisting of Drs. Weeks, Carlton and Dale, to draft a constitution and bylaws and to report at the next meeting, which it had been decided would be held at Old Point Comfort in conjunction with other national dental associations, in August of the next year.

At the first meeting it was decided to limit membership in the association to

colleges belonging to the National Association of Dental Faculties, and that all members of that body be invited to join the school. Adopting the suggestion of Dr. Weeks, the association was called the National School of Dental Technics.

August 7, 1894, the second meeting was held at the Hygeia hotel at Old Point Comfort, every school that took part in the initial meeting being represented. Dr. Weeks presented the report of the committee on constitution and bylaws and it was adopted.

The work of the school was carried on vigorously, the first few years being devoted entirely to methods of teaching operative and prosthetic technics. The field of pedagogics broadened gradually, so at a meeting in Cincinnati, December 28 and 29, 1898, it was decided to amend the constitution and called the association an Institute of Dental Pedagogics and under that name it has continued to flourish.

The burden of the work of the institute for several years lay largely on those who inaugurated the movement. From time to time other interested workers would join the ranks.

The institute is not a legislative body in any sense. Its work lies in the line of its members mutually benefiting each other in their respective fields as teachers—each teaching the other how to teach, so to speak. The papers read before the organization differ materially from those read before the usual dental societies, inasmuch as the whole idea of the Institute of Dental Pedagogics lies in methods of teaching specified branches of dentistry and showing the results of such teaching when practicable, rather than the generalization of the subject in hand as treated before the usual gatherings of dentists.

Membership is in college faculties as a whole, rather than individual members of faculties. Hence the personnel of the annual meetings of the institute is continually changing, owing to the change of delegates appointed each year by the respective faculties.

Nevertheless a number of men, indefatigable workers after the best way of teaching, have been responsible for its guidance, its energy and its progress. The more prominent ones perhaps are the following: Drs. G. V. Black, T. E. Weeks, D. M. Cattell, T. W. Brophy, C. S. Case, F. B. Noyes, J. B. and W. E. Willmott, A. E. Webster, S. H. Guilford, E. C. Kirk, F. Weisse, E. Hillyer, H. W. Arthur, G. E. Hunt, J. A. Byram, H. A. Smith, H. W. Morgan, J. A. Dale, N. S. Hoff, W. E. Grant, J. D. Patterson, H. P. Carlton, J. H. Kennerly, L. P. Bethel, D. R. Stubblefield, W. Crenshaw, H. E. Friesell, G. W. Dittmar and H. S. Goslee.

Many others also have contributed much of their time and zeal to the welfare of the dental teachers institute.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

BY GEO. E. HUNT, M. D., D. D. S., SECRETARY, INDIANAPOLIS.

Pursuant to a call published in the dental journals, representatives of a number of dental colleges met in the Sturtevant House, New York City, August 4, 1884, for the purpose of bringing about the adoption of a uniform standard of graduation. The following schools were represented: Baltimore College of Dental Surgery, Professors R. B. Winder and M. W. Foster; Boston Dental College, Professors J. N. Follett and A. N. Blodgett; Chicago College of Dental Surgery, Professor A. W. Harlan and Dr. F. H. Gardiner; Harvard University, Dental Department, Professor Thomas Fillebrown; Dental Department, State University of Iowa, Professor A. O. Hunt; New York College of Dentistry, Professors Frank Abbott and J. Bond Littig; Dental College of the University of Michigan, Professor J. Taft; Ohio College of Dental Surgery, Professor H. A. Smith; Pennsylvania College of Dental Surgery, Professors C. N. Peirce and Henry Leffman; Philadelphia Dental College, Professors J. E. Garretson and S. N. Guilford; University of Pennsylvania, Dental Department, Professors James Truman and E. T. Darby.

Letters were received from the deans of the Kansas City Dental College, and the University of California, Dental Department, indorsing the objects of the meeting, and pledging their respective colleges to support the movement. Professor W. M. Foster called the meeting to order and after briefly stating its objects, nominated Prof. C. N. Peirce for temporary chairman, who was elected. Prof. H. A. Smith was chosen secretary of the temporary organization. A committee on permanent organization, consisting of Professors Truman, Winder and Taft, was appointed; after a recess this committee reported the form of constitution, which was amended and adopted as follows:

CONSTITUTION.

Article I. This body shall be called the National Association of Dental Faculties.

Article II. The object of this Association shall be to promote the interests of dental education.

Article III. The officers shall consist of a President, a Vice-President, a Secretary and a Treasurer, who shall be elected by ballot and shall hold their offices until their successors are elected.

Article IV. Two-thirds of the colleges belonging to this Association shall be necessary to constitute a quorum.

Article V. Any contemplated change involving the interests of the schools represented, or of the Association, shall require one year's notice before any action is taken.

Article VI. Three members shall be elected who, with the officers, shall constitute an Executive Committee, who shall have power to designate the time and place for meeting, and make preparations for the same, and pass upon all credentials.

Article VII. Any reputable dental college may be represented in this body upon submitting to the Executive Committee satisfactory credentials, signing the constitution, conforming to the rules and regulations of this body, and paying such assessments as may be made.

The constitution was adopted and signed by the representatives of the following colleges:

Baltimore College of Dental Surgery.

Boston Dental College.

Chicago College of Dental Surgery.

Dental Department of the State University of Iowa.

Dental College of the University of Michigan.

New York College of Dentistry.

Ohio College of Dental Surgery.

Pennsylvania College of Dental Surgery.

Dental Department of the University of Pennsylvania.

Philadelphia Dental College.

Professor Thomas Fillebrown said that while he was in hearty sympathy with the movement, there had been no opportunity to have the matter brought before the Governing Board of Harvard University, and he was not authorized, therefore, to bind that institution by becoming a member of the Association.

It was ordered that any dental college which desires to join this Association during the intervals between its meetings, may be enrolled upon sending its application to the Committee on Membership, accompanied by satisfactory evidence that it has complied with the rules and regulations of the Association, and paying the assessments.

The following officers of the permanent organization were elected: C. N. Peirce, Philadelphia, President; R. B. Winder, Baltimore, Vice-president; H. A. Smith, Cincinnati, Secretary; A. W. Harlan, Chicago, Treasurer. Executive Committee—Frank Abbott, New York; Jas. Truman, Philadelphia, and J. Taft, Cincinnati.

Prof. Winder moved the abrogation, after the close of the session of 1884-1885, of the rule, accepting five years' practice as the equivalent of one year's course of lectures.

Prof. Truman moved as a substitute, that after the close of the session of 1884-1885, students at the dental colleges be required to attend two full regular courses of lectures before coming up for graduation. This was adopted, with a proviso to the effect that the two courses of lectures shall have been attended in separate years.

Prof. Smith offered a resolution that possession of a medical diploma be accepted as equivalent to one course of lectures in a dental college, provided the holder pass a satisfactory examination.

Prof. Abbott moved to amend by compelling the holder of a medical diploma, before coming forward for graduation, to pass one full year in the study of practical dentistry, which year shall include a regular course of lectures in a dental college.

Prof. Smith suggested that the practical studies should be pursued in a dental infirmary and not in a dental office. The suggestion was incorporated in the resolution, which was then adopted.

Prof. Abbott offered the following:

Resolved, That attendance on one course of lectures in a medical college be accepted as equivalent to one year's pupilage in a dental office, but one year medical students shall be required to attend two regular courses of lectures in a dental college.

This resolution was adopted.

Prof. Taft offered the following, which was adopted:

Resolved, That we recommend that three years of study of dentistry, including attendance upon two regular courses of lectures, be required of students previous to coming forward for graduation from a dental college.

A committee on curriculum was appointed, consisting of Professors J. Taft, James Truman and R. B. Winder.

Prof. Taft moved the next meeting be held one year hence, and to meet biennially after that. So ordered.

It was agreed to hold an adjourned session at Saratoga the ensuing day, August 5th.

Prof. Garretson offered the following resolution which was under discussion when the hour for adjournment arrived:

Resolved, That the colleges of this Association will receive into the senior class only such juniors as hold certificates of having passed a satisfactory examination in the studies of the junior year; this certificate to be a pledge to any college to which they may apply, that a previous term has been properly spent in the institution whence they came.

At the meeting at Saratoga, all the colleges that had signed the constitution were represented.

Prof. Garretson's resolution was referred to the committee on curriculum. Prof. Taft, from the committee on curriculum, submitted a report recommending preliminary examinations, and a graded curriculum.

The first recommendation was taken up, and the following was adopted:

Resolved, That a preliminary examination be required for entrance to our dental colleges; such requirements shall include a good English education. In case of any applicant failing to pass a satisfactory preliminary examination, the other colleges of this Association may be informed of the fact.

Resolved, That a candidate for matriculation, who presents a diploma from a reputable literary institution, or other evidence of literary qualification, shall be admitted without further examination.

An adjournment to the afternoon of August 6th having been taken, the recommendation of the committee on curriculum regarding the establishment of graded courses of study was taken up, and Prof. Abbott offered the following, which was adopted:

Resolved, That we agree to adopt a graded course of instruction, and an intermediate examination, which course of instruction and examination shall be conducted as the faculties of the different colleges represented in this association may deem proper. We recommend that the following subjects and arrangement be adopted by the colleges of this association, viz.:

First Year—Anatomy, with dissections; physiology, histology, chemistry, didactic and practical; mechanical dentistry.

Second Year—Review of junior year studies; pathology, surgery, materia medica, therapeutics, operative dentistry.

A committee, consisting of Profs. Foster, Abbott and A. O. Hunt, was appointed to lay before the National Association of Dental Examiners the action taken by this association.

The Secretary was authorized to send printed copies of the transactions to each of the schools represented in the association.

It was ordered that an assessment of two (2) dollars be made upon each college represented and signing the constitution.

The second regular meeting was held at the Sherman House in Chicago, beginning Friday, July 31, 1885. The Missouri Dental College was admitted to membership.

By resolution, the present method of giving senior certificates was inaugurated. It was also decided that applicants for admission to the senior class, from foreign countries, shall be required to furnish properly attested

evidence of study, attendance upon lectures, etc., the same as is required of junior students; and they shall also pass the intermediate examination.

It was ordered by resolution that a preliminary examination showing a good English education must be passed before entering the freshman class; a diploma from a reputable literary institution or other evidence of literary qualification, will be accepted without examination. A rule that no college shall give credit for a full term to any student who has entered later than twenty days after the opening of school, was adopted.

The third regular meeting was held in the Park Theater, Niagara Falls, August 2, 3, and 4, 1886.

The following colleges were admitted to membership: Vanderbilt University Dental Department, Harvard University Dental Department; Minnesota Hospital College, Dental Department; St. Paul Medical College, Dental Department.

The committee on text books recommended that steps be taken to secure uniform text books for use in all colleges.

It was resolved that schools which did not conform with the rules of the association should not be recognized by it, and that the Examiners' Association be requested to take action in reference to such schools.

The fourth meeting was held in the Ebbitt House, Washington, D. C., September 3, 5 and 6, 1887.

At the meeting a year previous, several members had been appointed to secure the writing of uniform text books; at this meeting they reported progress as follows:

Dr. Brophy reported that a work on oral surgery was in preparation; Dr. A. O. Hunt reported that a work on dental chemistry and metallurgy was in preparation; Dr. S. H. Guilford reported progress on a work on dental prosthesis; Dr. Fillebrown reported progress on a work on operative dentistry; Dr. Truman reported that he had been unable to find a satisfactory person to write a book on dental pathology.

The following schools were elected to membership: Northwestern College of Dental Surgery, Chicago; Louisville College of Dentistry; Indiana Dental College; Northwestern University Dental School, Chicago; Dental Department of Southern Medical College, Atlanta, Georgia; Dental Department, University of Tennessee, Nashville; School of Dentistry, Meharry Medical Department, Nashville.

It was decided that the conferring of honorary degrees should be discouraged. At this meeting the first ad-interim committee was appointed, consisting of Drs. James Truman, H. A. Smith and T. W. Brophy.

The fifth meeting was held in the Galt House, Louisville, Kentucky, in 1888, from August 27 to 30 inclusive.

The National University Dental Department, Washington, D. C., was elected to membership.

The dental departments of the Minnesota Hospital College and the St. Paul Medical College, were united to form the College of Dentistry, University of Minnesota. The association held that the newly formed school must wait a year and be balloted on.

The question had been agitated for some time of establishing a more satisfactory length of course, and an expression of preference was gathered at this meeting through a roll call. This showed five schools in favor of a three years' course, with nine months in each; three schools in favor of a course of three years with five months in each; one school in favor of a course of three years with six months in each year; one school in favor of a two years' course of twelve months each; three schools in favor of two years with seven months in each; three schools in favor of two years with six months in each, and two schools in favor of two years with five months in each. This expression of discordant views prevented an agreement to a decided increase of the length of course, or the months of study in each, at this time.

The meeting in 1889 was held at Saratoga Springs, on August 5th. Eighteen schools were present by their representatives. The Columbian University Dental Department, and University of Maryland Dental Department were elected to membership at this session, and were also represented. At this session the Royal College of Dental Surgeons of Ontario was reported upon favorably for membership.

By a vote of twelve to six, a three years' course before examination for graduation was established, and by a vote of eighteen to one, the length of each annual course was made "not less than five months each." This new rule became operative with the session for 1891-2.

A request was made by one of the members for permission to grant the degree of D. D. S. upon a prominent practitioner without attendance upon lectures, but the authority to do so was declined. It was also ordered that no honorary degrees should be conferred by any of the schools of the association without first submitting the names of the persons to be thus honored, to the association for approval.

In August, 1890, the meeting of the association was held at Excelsior Springs, Missouri. There were twenty schools represented here, including the Minnesota school and the American College of Dental Surgery, Chicago, admitted at this session.

A resolution was adopted allowing the holder of a diploma from a reputable medical college to enter the second years' work in dental colleges, but excusing him from attending the lectures and examinations in General anatomy, chemistry, physiology, materia medica and therapeutics.

A resolution was also adopted that the minimum fees for the full annual course of lectures should be \$100; that there should be a final examination fee of \$25, and an annual matriculation fee of \$5. The fees for a special course were fixed at \$10 for each branch taken, and the matriculation fee at \$5.

In August, 1891, the association met at Saratoga Springs. Twenty-three colleges were represented and the Dental Department of the University of Denver was taken into membership. An attempt was made to more clearly define the preliminary examination and to direct the committee on schools to prepare a list of three hundred questions for such examination, but it was decided to leave the rule requiring a good English education for admission, to stand without further amplification.

Dr. Abbott proposed that all students who do not remain in the college infirmaries during the interim between the regular sessions, should present a certificate from their preceptors that they have devoted the time between sessions in the study and practice of dentistry. This proposition was defeated almost unanimously.

The next meeting of the association was held at Niagara Falls in August, 1892, twenty-five colleges being in attendance. An attempt was made to forbid the conferring of honorary degrees by any college belonging to the association. This proposition was defeated by a vote of fifteen to nine.

A protest against the census classification of dentists as manufacturers, under what was known as the Wilcox Bill, was adopted.

The meeting of 1893 convened on August 10th, in Chicago. There were then thirty-one dental colleges in the association. It was decided that a dental student could not complete one year's course of six months in June and then begin his second years' course in October, in another school, and complete his course in March following, without violating the rule of the association. Graduates in pharmacy were allowed to matriculate as juniors in the colleges of the association. The Detroit College of Medicine, Department of Dental Surgery, was admitted to membership.

The eleventh annual meeting was held at Old Point Comfort in August, 1894. At this meeting it was decided that beginning with the session of 1896-7 the school year in colleges belonging to the association should be six months. A resolution was adopted which required the endorsement of the State Board of Dental Examiners of the state in which a school was located

that applied for admission to membership, before such school could be admitted to the association. The association declared by resolution that it was inconsistent for a member of a faculty of any college to be a member of any State Board of Dental Examiners, the vote standing thirteen for, and seven against the proposition.

The Western Dental College of Kansas City was admitted as a member of the association.

At the twelfth annual session, held at Asbury Park, New Jersey, in 1895, the membership of the association consisted of thirty-eight schools, every one of which was represented. The University College of Medicine, Dental Department, of Richmond, Virginia; the Atlanta Dental College, of Atlanta, Georgia, the Birmingham Dental College, of Birmingham, Alabama, and the Dental Department of the University of Medicine and Surgery, of Cleveland, Ohio, were admitted to membership during this meeting.

It was decided that beginning with the session of 1896-7 all examinations conducted by the members of this association must be given in the English language.

The session of 1896 was held at Saratoga, New York, on August 1st, Howard University Dental Department, Washington, D. C., was admitted to membership, as were also the Dental Department of Marion Sims Medical College of St. Louis, Missouri, and the Tennessee Medical College, Dental Department, of Knoxville, Tennessee.

A resolution was adopted requiring that a graduate of a recognized dental school who applies to a member of this association for the degree of D. D. S., shall complete one full year's course of instruction in said college, and comply with all its requirements of the senior year.

The adoption of the academic costume was recommended under the requirements observed by the intercollegiate system. Lilac was chosen as the color representing dentistry.

A communication was received from the National Association of Dental Examiners requesting the Faculties Association to enact a rule which would prohibit colleges from receiving beneficiary students. This led the association to adopt a rule advising its members to abandon the practice of bestowing scholarships.

The session of 1897 took place at Old Point Comfort, Virginia. There were then forty-four colleges on the membership roll of the association. The Dental Department of the Milwaukee Medical College, of Milwaukee, Wisconsin; the Tacoma College of Dental Surgery, Tacoma, Washington; the New York Dental College; the Dental Department of the Ohio Medical University,

Columbus, Ohio, and the Baltimore Medical College, Dental Department, of Baltimore, Maryland, were elected to membership.

The University of Iowa requested the approval of the association upon its decision and desire to confer the degree of Doctor of Dental Surgery on a most prominent member of the Iowa profession. This was referred to the executive committee, who reported adversely. The report was adopted.

Dr. Barrett, of Buffalo, read a paper on the study of anatomy which was ordered printed in the dental journals, and the association determined to introduce the reading of brief papers at each meeting.

A resolution was introduced looking to a four years' course in all schools belonging to the association, to begin in 1900-1. It was not seriously entertained.

It was also resolved that the minimum preliminary educational requirements in the colleges of this association should be a certificate of entrance to the first year of a high school, or where there were no high schools, of graduation from a grammar school or its equivalent, to be determined by an examination.

The fifteenth annual meeting of the association was held at Omaha, Nebraska, in August, 1898. Forty-seven members then comprised the association, of whom thirty-three were present at roll call. The Dental Department of the University of Omaha, Nebraska; Colorado College of Dental Surgery, Denver, Colorado; Dental Department College of Physicians and Surgeons of San Francisco, California, and the Pittsburg Dental College, Pittsburg, Pennsylvania, were elected to membership.

The Northwestern College of Dental Surgery, Chicago, Illinois, notified the association of its retirement from active educational work, and was granted the privilege of withdrawing from the membership.

A committee of three was appointed to prepare a practical system of nomenclature to be recommended to the teaching faculties.

The committee on foreign relations was created, whose duty it is "to report each year upon the relative status of dentistry in America and Europe, and which shall suggest measures that will promote the welfare of the profession and the usefulness of the American dental degree." This committee was to ferret out fraudulent or irregular colleges or the granting of degrees irregularly by recognized colleges. It created an advisory board, consisting of three members in each of the following countries: (1) Great Britain; (2) Holland and Belgium; (3) Denmark, Norway and Sweden; (4) Russia; (5) Germany; (6) Austria and Hungary; (7) Italy and Greece; (8) France; (9) Spain and Portugal; (10) Switzerland and Turkey, to whom the papers

of any foreign applicants who may present themselves to American dental colleges for admission, may be referred for verification or endorsement.

The next meeting of the association took place at Niagara Falls the last days of July and the first of August, 1899. Thirty-six members out of a membership of forty-six were in attendance. The Tacoma College of Dental Surgery was given permission to change its name to North Pacific Dental College, without affecting its membership in the association.

A resolution offered by Dr. Taft was considered and adopted, providing for the creation of a commission which should take cognizance and investigate and advise with any parties contemplating the establishment of a new college or the reorganization of an old one. The consideration to be uppermost in the mind of this commission was to be the motive that prompts such an organization, the need for it, the proposed locality, the character and ability of those who propose to conduct it, the sufficiency of the resources, etc. This was intended to put a check upon the starting of insufficiently equipped schools, and proved quite effective in stopping their mushroom growth.

The Medico-Chirurgical College, Dental Department, of Philadelphia; University of Southern California, Dental Department, Los Angeles, California, and Illinois College of Dentistry, Chicago, were received into membership at this session.

The length and term of each year's course was extended from six months to seven months, becoming operative with the session of 1899-1900. The committee on law was created which was authorized to levy such assessment upon the members of the association as may be needed for the payment of legal expenses incurred in the suppression of fraudulent diplomas, etc.

Advisory committees to the foreign advisory board were added for Japan, China and India, Australia and New Zealand.

The next meeting of the association was held at Old Point Comfort, Virginia, in July, 1900; thirty-seven schools were represented. It was decided that beginning with the year 1902-3 the minimum preliminary educational requirement of students shall be a certificate into the third year of a high school, or its equivalent, and it was stipulated that this preliminary education should be placed in the hands of the State Superintendents of Public Instruction.

The Central College of Dentistry of Indianapolis, Indiana, was elected to membership.

The committee on curriculum submitted a report recommending certain subjects to be taught didactically, and laying out a scheme for lecture work in each subject, and also for laboratory and clinical work. This program was printed in the transactions, but not definitely adopted.

The committee on schools submitted a report, from which it appeared that there were 2,367 freshman, 2,280 junior and 2,015 senior students in the year 1899-1900; a total number of matriculates of 6,662; of this number 6,359 finished their attendance, and 1869 were graduated. Of the students in attendance, 131 were women. For the sessions 1898-1899 there were 6,130 matriculates, of whom 6,088 actually attended, and 1,705 were graduated. To this should be added the enrollment in schools not members of the association, which brought the total enrollment for the year 1899-1900 up to 7,056, and the number of graduates to 1,928. There were engaged in the thirty-nine schools embraced in this report: 400 professors, 276 clinical instructors, 128 lecturers, 164 demonstrators and 121 assistants—a total teaching force of 1,089.

A penalty for violating the rules of the association by any of its members was established this year.

It was ordered that advanced standing in the classes of the members of this association shall not be given excepting to students who have taken a full course in a school, a member of this association, or one that is especially recognized and who shall have successfully passed the required examinations, or when such student shall present evidence of graduation from a reputable medical college.

A resolution requiring four full courses in separate academic years before final graduation for all matriculates for the session of 1902 and thereafter, was again introduced.

The Washington Dental College and Hospital of Oral Surgery of Washington, D. C., was elected to membership.

The next meeting of the association was held at Milwaukee, Wisconsin, on August 2, 1901. The New Orleans College of Dentistry was elected to membership. An order was passed fixing the opening of sessions of schools of this association not later than the first Tuesday in October of each year. This became operative in the school year of 1902-3. The question of instituting a four year course, each year to consist of not less than six months, was again agitated and discussed during this session. It was adopted to go into effect in 1904-5.

A communication was received from the National Association of Dental Examiners, that that association would place no school or college, or continue it, upon its recognized list, unless such college is a member of the National Association of Dental Faculties.

A resolution that full credit should not be given by members of this association for courses of instruction which did not commence in the morning

and continue through the day, was extensively discussed during this session. It was particularly applicable to a dental school in the city of Washington.

Mr. Henry E. Davis, professor of Jurisprudence in the National University of Washington, D. C., informed the association that an injunction had been issued against this association and every officer of it, enjoining them from further action concerning that institution; and that it forbids any action whatever by the association of any officer or member of it with reference to the status of the National University.

The association adopted a resolution that the Dental Department of the National University of Washington, D. C., had forfeited the respect of the members of this association, and rendered itself unfit to continue as a member thereof, and that inasmuch as the legal proceedings referred to were still pending and the association desired to show its respect to the courts and judicial process, no further action be taken with reference to this school at the present session.

Consul Woerman of Munich, Germany, addressed this meeting with reference to the sentiment in Europe with reference to certain colleges in this country, and especially one located in Illinois, which was doing very questionable work and was said to reflect discredit upon American dental education, abroad. The matter therein complained of was turned over to the foreign relations committee for investigation. This resulted in a resolution empowering the committee on foreign relations, with the approval of the committee on law, to employ counsel and commence suits for the suppression of fraudulent and irregular degree granting institutions. Dr. J. N. Crouse volunteered to assume the direction of prosecutions under this resolution, so far as it might refer to Illinois, but no action was taken.

A cable message was sent to the Internationale Federation Dentaire in Europe, then in session in London, advising them that the four year dental course had been adopted by this association, and a reply was received expressing the gratification of that body, and hearty approval.

The next meeting of the association was held at Niagara Falls, on July 24, 1902. The Dental Department of the Wisconsin College of Physicians and Surgeons, of Milwaukee, was admitted to membership.

It was decided that students who have pursued courses of instruction in foreign dental education institutions should have their reception and admission to advance standing, in the schools of this association, determined by the foreign relations committee.

The difficulty with the National University of Washington, D. C., Dental Department, which had been charged with violation of the rules, was reported as having been satisfactorily adjusted. That school requested to be placed

upon the roll of membership. It was voted that the school be penalized to the extent of the expenses it had caused the association.

Upon motion of Dr. G. V. Black, it was ordered that students cannot receive credit for matriculation and attendance for less than one-half of one session, and if they matriculate later, it must be under the conditions in force when they re-enter; in case they leave off their school work for a greater period than one year, they must resume the work under the conditions in force at the time of such re-entrance.

A resolution was offered by Dr. Brophy with reference to the preliminary qualifications that should be required of students seeking admission to the colleges of the association beginning with the session of 1904-5, and prescribing as a minimum a certificate of high school graduation or its equivalent. This had to lie over under the rules. Up to the present date, 1908, it has not been adopted, although there is a resolution now pending to be acted upon in 1909 to the same end.

The twentieth annual meeting took place in Ashville, North Carolina, July 24th, 25th and 27th, 1903.

Harvard University Dental School notified the association that it could not extend its course to four years, as it was then engaged in raising the standard of entrance to that which prevails for entrance to Harvard College. The dean expressed the belief that higher preliminary requirements were of greater importance for the status of the profession than an additional year to the course, but that Harvard did not feel ready at that time to take both steps together. It was claimed "that no amount of professional education would make an educated man, he must be educated before coming to the profession."

This matter was referred to the special committee of five, who reported "that the association cannot under the rules concede that Harvard is entitled to one year less time than other schools that have an equal standard of admission, with an exception, it may be, with analytical chemistry and physics." This was adopted. Harvard University Dental School then tendered its resignation, which was accepted. It has not since been in affiliation.

It was ordered that no student should be matriculated for any course of the curriculum, who cannot read and write English sufficiently to intelligently comprehend what is given, and that an examination shall be conducted by the Superintendent of Public Instruction, or his appointee, who conducts the preliminary examination of the dental institution.

Upon motion by Dr. Brophy, it was ordered that no student coming from a foreign country shall be received into advanced standing by any member of this association until his credentials shall be certified to by the members of

the advisory board for the country from which he claims to come, and passed on by the foreign relations committee.

Dr. Crouse, chairman of the prosecuting committee, submitted a report in which it was shown that proceedings had been commenced against Illinois licenses that had been issued over forged signatures of some of the members of the board. All the parties concerned were foreigners and mostly Germans.

This Committee also reported that the Illinois State Dental Society had voted twenty-seven hundred dollars (\$2,700.00) in the last two years toward the prosecution of fraudulent schools, fraudulent diplomas and fraudulent licenses. This resulted in the retirement from active work of one of the dental colleges located in Chicago.

A communication was received from the National Association of Dental Examiners in which that body expressed its unqualified disapproval of issuing diplomas by any dental college at any other time than at the regular commencement exercises, and requested the N. A. D. F. to adopt proper measures prohibiting such irregular issuance.

Further money was voted for the use of the prosecuting committee; an assessment of \$100 was laid upon each college.

The Dental Department of the University of Tennessee was allowed to change its name to "University of Tennessee, Department of Dentistry," and the Ohio University Medical Department to "College of Dentistry, Ohio University."

The association met again on June 9th to 11th, 1904, at the Ebbitt House, Washington, D. C.

The Department of Dental Surgery of the Wisconsin College of Physicians and Surgeons was admitted to membership, as was also the Lincoln Dental College, of Lincoln, Nebraska.

The count system of determining the preliminary education of students was adopted at this meeting, but has not yet been fully established. It was also decided that under the four years' course, the members of this association had the right to credit students with one year's work, who had earned the degree of A. B., in course, similar to the chemical, biological course of the Johns Hopkins University.

The question of sustaining the four years' course, of seven months each, decided upon at the last previous meeting occupied a great deal of attention at this meeting. A movement was made to change it to four years of six months; to three years of seven months; and to three years of twenty-eight teaching weeks; all of these motions were defeated.

At the adjournment of this meeting, there was a great deal of feeling of unrest, and dissatisfaction by reason of the advent of the four years' system,

which was due to begin with the next school year. As a result a special meeting was called, which convened on July 18th of this year at St. Louis, Missouri.

At this meeting it was decided to change the course back to three years, but to require that each year should have thirty weeks in actual dental teaching, each week to consist of six days, and that this time was to be exclusive of holidays, and that all rules in conflict with this adjustment should stand repealed. There were twenty-eight schools present and voting, of whom twenty-six voted in the affirmative. The Association at that time was composed of fifty-two schools.

The meeting for 1905 was held on July 27th, at the Iroquois Hotel, Buffalo.

Marion Sims Dental College of St. Louis was permitted to change its name to the St. Louis Dental College, and the New York Dental School to the College of Dental and Oral Surgery of New York.

A great share of the time of this body was consumed by determining a uniform schedule of tuition fees.

Dr. Woerman, a former United States Consul at Munich, was present, and addressed the association at great length with reference to European conditions with regard to the recognition of the American dental degree; to colleges that had granted fraudulent diplomas and to fraudulently obtained licenses.

It was shown that four thousand three hundred dollars (\$4,300) had been provided by the dental profession in the prosecution of holders of illegal degrees, and those concerned in their issuance.

The meeting of 1906 convened at Atlanta, Georgia, on September 14th.

The Barnes Dental Department of Barnes University, St. Louis, Missouri, was admitted to membership.

A resolution was introduced providing that schools belonging to the Association in which instruction is given entirely in any language, and to students speaking and writing that language, the rule requiring the use of the English language exclusively should be suspended, provided it effected only schools without the territory of the United States.

Creighton University Dental School demanded the rights and privileges of membership in the association as the successor of the Dental Department of the University of Omaha, with which it had consolidated. This was denied, as under the rules it had to come in as a new school, and comply with the requirements of admission of such institutions.

A number of schools were suspended because they had failed to comply with the minimum standard of tuition fees established by the association.

The constitution, by-laws and codified rules were re-enacted at this session.

A conference committee to adjust matters of difference between the National Association of Dental Examiners and this association was appointed. This committee has existed from that time on, counselling with a like committee from that association in matters concerning dental education.

The 24th annual meeting was held at Minneapolis, Minnesota, July 26th and 27th, 1907.

Six of the suspended schools were reinstated, and three tendered their resignations.

Preliminary educational qualification equal to three years' completed high school work for students of dentistry was established. This standard of requirement went into effect in 1907 to '08.

Dr. Brosius, of Berlin, Germany, was present, and addressed the association with reference to the conditions surrounding American dentists in Germany.

The most recent meeting of the association convened July 24th and 25th, 1908, at Boston, Mass.

There were then forty-three schools upon the roll of membership of the association, of which thirty-three were represented. A resolution was passed declaring it the sense of the association that state boards should examine junior students before their promotion into the senior classes, and having once passed a subject, a student need not be examined by the board in that subject again.

A resolution to create a National Examining Board of three members to pass upon the qualifications of students for advanced standing, whose finding in such matter should be conclusive and binding, upon all schools belonging to the Association, was discussed at some length. It was referred to a committee of five to deliberate upon, and to report later.

It was ordered that, beginning with 1909 to '10, all schools of the Association shall extend their courses to not less than thirty-two weeks of teaching, each week to embrace six days of actual school work.

The Association suspended its rules for the purpose of honoring Dr. V. Guerini, of Naples, Italy; and authorizing the Chicago College of Dental Surgery to confer its honorary degree upon him. In reply to this compliment the following acknowledgment addressed to the secretary of the association was received:

Naples, August 31, 1908.

Dear Doctor: In possession of your honored letter, I thank you for your kind communication, and pray you to present my best thanks to the President and members of

the National Association of Dental Faculties for the honor they have conferred upon me.

With sincere regards, I am,

Respectfully yours,

V. GUERINI.

Dr. J. W. Spaulding, of Paris, France, was invited to the privileges of the floor, and spoke at some length about conditions of dentistry and requirements to enter practice in that country.

The following are the names of the officers of the Association, who have conducted its affairs since the beginning to the present date:

- 1884-86—Pres., C. N. Pierce, Philadelphia; Vice-Pres., R. B. Winder, Baltimore; Sec., H. A. Smith, Cincinnati; Treas., A. W. Harlan, Chicago.
- 1887—Pres., A. O. Hunt, Iowa City; Vice-Pres., Thos. Fillebrown, Boston; Sec., J. E. Cravens, Indianapolis; Treas., A. W. Harlan.
- 1888—Pres., A. O. Hunt; Vice-Pres., L. D. Carpenter, Atlanta; Sec., J. E. Cravens; Treas., A. W. Harlan.
- 1889—Pres., James Truman, Philadelphia; Vice-Pres., L. D. Carpenter; Sec., J. E. Cravens; Treas., A. W. Harlan.
- 1890—Pres., L. D. Carpenter; Vice-Pres., W. H. Eames, St. Louis; Sec., J. D. Patterson, Kansas City; Treas., H. A. Smith, Cincinnati.
- 1891—Pres., W. H. Eames; Vice-Pres., J. D. Patterson; Sec., J. D. Patterson; Treas., H. A. Smith.
- 1892—Pres., J. D. Patterson; Vice-Pres., H. A. Smith; Sec., J. E. Cravens; Treas., H. A. Smith.
- 1893—Pres., H. A. Smith; Vice-Pres., C. L. Goddard; Sec., J. E. Cravens; Treas., Henry W. Morgan served to 1901.
- 1894—Pres., Frank Abbott; Vice-Pres., S. H. Guilford; Sec., Louis Ottofy.
- 1895—Pres., S. H. Guilford; Vice-Pres., George H. Cushing; Sec., Louis Ottofy.
- 1896—Pres., J. P. Gray; Vice-Pres., T. W. Brophy; Sec., Louis Ottofy.
- 1897—Pres., T. W. Brophy; Vice-Pres., D. J. McMillan; Sec., J. H. Kennerly.
- 1898—Pres., D. J. McMillan; Vice-Pres., B. Holly Smith; Sec., J. H. Kennerly.
- 1899—Pres., J. Taft; Vice-Pres., B. Holly Smith; Sec., J. H. Kennerly.
- 1900—Pres., B. Holly Smith; Vice-Pres., Wilbur F. Litch; Sec., J. H. Kennerly.
- 1901—Pres., Wilbur F. Litch; Vice-Pres., Geo. V. I. Brown; Sec., J. H. Kennerly.
- 1902—Pres., Henry W. Morgan; Vice-Pres., W. T. McLean; Sec., J. H. Kennerly; Treas., N. S. Hoff.
- 1903—Pres., M. C. Marshall; Vice-Pres., E. C. Kirk; Sec., J. H. Kennerly; Treasurer H. R. Jewett served to the present (1908) date.
- 1904—Pres., S. W. Foster; Vice-Pres., M. W. Foster; Sec., J. H. Kennerly.
- 1905—Pres., J. H. Kennerly; Vice-Pres., John I. Hart; Sec., George E. Hunt.
- 1906—Pres., John I. Hart (Died June 9, 1907); Vice-Pres., Frank Holland (presided); Sec., George E. Hunt.
- 1907—Pres., M. W. Foster; Vice-Pres., H. P. Tileston; Sec., George E. Hunt.
- 1908—Pres., H. B. Tileston; Vice-Pres., E. W. Branigan; Sec., George E. Hunt.

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